Ca' Foscari
University
of Venice

Master's Degree Programme

in Language and Management to China

Final Thesis

China's role in the next phase of Globalization

Towards a China-centered tech ecosystem?

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Academic Year
2022 / 2023

“Una laurea ad honorem

A te che sei la più forte”

前言

过去三十年间，货物、资金和思想的跨境流动显著增加，重新配置了国与国之间及国家内部的关系和政策，这在全球化的国际市场中至关重要。然而，纵观当前全球经济和地缘政治的最新变化，全球化现象显然正处于转型阶段。事实上，市场紧张情势、地缘政治竞争和特别针对科技业的保护主义措施（中美贸易战），加上冠状病毒大流行、全球通膨及俄乌军事冲突所带来的全球经济严重后果，加剧始于2007-08年金融危机的去全球化（或慢全球化）道路。然而，这并非全部样貌。事实上，全球化仍正在持续进行，即使是沿着新道路前进。由于科技发展和数据爆炸，世界已逐渐过渡到数字全球化。"世界各国间的交流从有形的物质产品过渡到更多的无形产品，如教育、医疗和文化，而迄今的交流则更以数据、信息、技术和金融为主"（Wang H. and Miao L. , 2022, p.100）。就数字化而言，世界从未像现在这样紧密相连。"新兴经济体有史以来第一次占了全球一半以上的贸易量，而南南贸易则是增长最快的连结类型"（麦肯锡公司，2016，第vi页）。跨境服务比跨境货物贸易增长得更快，它们产生的经济价值也更多。此外，自2005年以来，跨境带宽使用量急剧增加，预计未来将增加更多。数字平台已经彻底改变了国际商务的经济状况，降低了国际互动和交易的价格。发展了全球市场和用户社区，为企业提供了庞大潜在的客户群和有效的接触管道，并促进微型跨国公司和个人直接参与全球贸易。"商品生产价值链（计算机和电子产品）变得更加区域性，特别集中在亚洲和欧洲"（McKinsey & Company, 2019, p.8）。新兴经济体正改善其区域供应链，减少了对中间进口投入的依赖。此外，跨境数据流和新科技，如数位平台、物联网、自动化和人工智能，正重塑全球价值链体系，使得该体系变得更为知识和劳动密集型。企业正面临比以往更复杂的未知因素，使其适应性及变通性显得更为重要。由于全球业务的成本和风险不断变化，企业必须选择价值链上的竞争地点，并重新评估其区域面。随着快速进入市场得重要性，越来越多的企业在靠近需求的地方制造生产，或搬迁到新的新兴中心，使供应链本地化，以实现最佳成本和生产管理。换句话说，全球化并没有被去全球化（或慢全球化）所取代；反而已经进入一个新的阶段。早期，它是以贸易为基础，由西方主导。现在，全球化正由数字技术推动，中国和其他发展中国家正处于领先地位。中国的科技企业和数字平台，如

华为、小米和阿里巴巴，多年来已经在5G技术、光纤网络、蜂窝网络设备、智能手机市场和电子商务方面确立了自己全球的领先地位。这个新阶段将提供经济和社会效益，包括创新和生产力的提高，对信息的特殊访问，以及消费者和供应商之间的全球连接。此外，它将是颠覆性的。那些有利建造基础设施、机构和商业环境的地方将因优势而被青睐。另外，由于数据爆炸，未来掌握在那些管理数据算法和全球信息交流之人的手中。这些效益明确且为数可观，然而挑战也大。中国对数字全球化所产生严重混乱情势的回应，取决于它在东南亚信息及通信技术产业发展（FDI和ODI）和主要国际合作新措施（BRI - DSR）中的驱动力。为了努力达到全球前沿技术，针对制造业和服务业的外资及对外直接投资将对中国有着决定性的影响,不仅可推动中国和东南亚地区的技术创新，还可在全球因技术创新带来潜在利益。此外，″预计在2025年之前，中国所产生的数据将比世界上任何其他国家都还要来的多，且正迈向成为一个数位国家″（Wang H. and Miao L., 2022, p.91），分析中国将在何种程度上利用主要国际合作新措施（BRI - DSR）作为创造全球价值链及区域化政策的工具，进而促使中国成为主导数字全球化的驱动力。根据上述内容，本论文将讨论中国在东南亚ICT产业发展中所扮演的关键角色，以及就中国在全球市场的地位如何从 ″世界工厂 ″转向创新经济和数位国家进行深入分析。此外本论文还论述中国对当代世界经济和地缘政治变化的贡献，及正如何重塑全球化情势（BRI-DSR）。本论文共分为三章。第一章，概述全球化主要趋势，特别聚焦在数字全球化；重塑的全球价值链框架、经济行为体间的互动及权利抗衡。接着，从商业角度衡量数位经济价值。最后，简要分析国际贸易体制中的数据流政策、战略和竞争。 第二章，详尽描述中国融入ICT全球价值链的过程。此外，还深入分析中国在过去20年作为 ″世界工厂 ″地位的调整，此结果造成出口导向型产业和国内市场导向型生产网络同时并存在整个东部、西部和中部地区。之后，研究方向聚焦在中国为东南亚地区技术升级的重要驱动力，以及中国的数位崛起及试图打造一个平衡的数据资产生态系统。最后一章，概述 ″一带一路″--数位丝绸之路新措施的主要目标和项目，同时特别介绍作为中国主导的新全球区域主义工具BRI--DSR。阿里巴巴及其全球贸易新措施eWTP--电子世界贸易平台—为本论文主要的案例研究，因就进展和重要性而言，阿里巴巴显示了中国数位及市场成就。“阿里巴巴的eWTP数位平台是一个反霸权的讨论平台，基于其经济和技术能力及其对BRI和中国政府的支持 ，试图由中国主导的全球化数位贸易秩序，挑战先前由西方主导的全球化和现有的全球贸易制度″（Bosetti. R、 (Bosetti. R., 2020; Seoane MFV, 2020, p.68,79) 。总

结，就现代地缘政治和市场变化的背景下，针对中国作为数位全球化驱动者的未来前景提出相关见解 (Lund S. and Tyson L., 2018; McKinsey & Company, 2016; Fariselli P., 2020; McKinsey & Company, 2019; Wang H. and Miao L., 2022; ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; UNCTAD, 2022; Chen X., Miao T., and Li X., 2020; The Economist, 26/01/2019; Seoane MFV, 2020; Bosetti. R., 2020) 。

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Introduction

The remarkable increase in cross-border flows of goods, money and ideas that have reconfigured the inter- and intra-national relations and policies during the last thirty years have been crucial within a globalized international market. However, looking at the recent changes that characterize the current global economic and geopolitical scenario, the phenomenon of Globalization is clearly in transition. Indeed, the market tensions, geopolitical rivalries and protectionist measures that have primarily targeted the technology industry (US-China trade war), as well as the severe global economic consequences arising from the Covid-19 pandemic, the global inflation and the Russia-Ukraine military conflict have exacerbated a path that began with the 2007-08 financial crisis, leading to a reaction to the previous scenario that is defined by many as Deglobalization (or Slowbalization). However, this is not the whole tale. In fact, Globalization is continuing its onward march, although along new paths. The world has gradually transitioned into a Digital Globalization as a result of the development of technology and the explosion of data. "The exchange between nations globally has evolved from physical goods to more intangible products such as education, healthcare and culture, to now an exchange focused on data, information, technology and finance" (Wang H. and Miao L., 2022, p.100). Digitally speaking, the world has never been more linked. "Emerging economies are counterparts on more than half of global trade flows for the first time in history, and South-South trade is the fastest-growing type of connection" (McKinsey & Company, 2016, p. vi). Cross-border services are growing more rapidly than cross-border trade in goods, and they generate significantly more economic value. Moreover, cross-border bandwidth usage has increased dramatically since 2005, and it is projected to increase even more in the future. Digital platforms have revolutionized the economics of international commerce, reducing the price of international interactions and transactions. They have developed global marketplaces and user communities, offering enterprises with a vast pool of potential customers and effective means to reach them, as well as fostering the direct participation of micro-multinationals and individuals in global commerce. "Goods-producing value chains (computers and electronics) are becoming more regionally concentrated, especially within Asia and Europe" (McKinsey & Company, 2019, p.8). Emerging economies are improving their regional supply chains, therefore decreasing their dependence on imported

intermediate inputs. In addition, cross-border data flows and new technologies, such as digital platforms, the internet of things, automation, and artificial intelligence, are reshaping the GVCs system, which is becoming more knowledge and labor-intensive. Thus, businesses are dealing with more complicated unknowns than ever before, making adaptability and resiliency crucial. Due to the shifting costs and risks of global operations, firms must choose where to compete along the value chain and reevaluate their regional footprint. As speed to market becomes vital, a rising number of businesses are building manufacturing near to demand or relocating to new emerging hubs, localizing supply chains for optimal cost and production coordination. In other words, Globalization has not been replaced by Deglobalization (or Slowbalization); rather, it has entered a new phase. In its earlier version, it was trade-based and led by the West. Globalization is now being pushed by digital technology, and China and other developing countries are taking the lead. Chinese technological businesses and digital platforms, such as Huawei, Xiaomi, and Alibaba, have established themselves as global leaders in 5G technology, fiber-optic networks, cellular network equipment, smartphone markets, and e-commerce throughout the years. This new phase will provide economic and social benefits, including an increase in innovation and productivity, exceptional access to information, and global connections between consumers and suppliers. Additionally, it will be disruptive. Locations that effectively construct infrastructures, institutions, and business environments will be favored by advantageous opportunities. Moreover, due to the data explosion, the future is in the hands of those who manage data algorithms and the worldwide interchange of information. The benefits will be tangible and substantial, while the challenges will be significant. Within the scenario of profound disruption generated by Digital Globalization, a potential response from China depends on its role as a driver in the development of the ICT industry in South-East Asia (FDI and ODI) and in major international cooperation initiatives (BRI - DSR). In an effort to reach the global technology frontier, FDI and ODI in manufacturing and services will be crucial for China in driving the country and the South-East Asian region towards technological innovation with potential benefits on a global scale. In addition, “with China forecasted to generate more data than any other nation in the world by 2025, and its strides in becoming a digital nation” (Wang H. and Miao L., 2022, p.91), it would be interesting to analyze the extent to which China will use major international cooperation initiatives (BRI - DSR) as a tool to create GVCs, Regionalization policies, thus becoming a driver of a more inclusive China-led Digital Globalization. Starting from the abovementioned premises, the following dissertation offers a deep insight on the key role taken by China as a driver in the

development of South-East Asia ICT industry, alongside the factors through which China's position in the global market switched from a "world's factory" to an innovative economy and digital nation. This work also considers the contribution of China to the contemporary worldwide economical and geopolitical changes and to the progressive reshaping of Globalization scenario (BRI- DSR). This study is organized in three chapters. In the first chapter, a general description of major Globalization's trends is made, focusing on Digital Globalization; reshaped GVCs' framework, participation, and power imbalances among economic actors involved. Then, an attempt on measuring the volume and the economic value of data from a business perspective is presented. To conclude, a brief insight on data flows policies, strategies and competition in the international trade regime is made. In the second chapter, the process of China's integration into ICT GVC is thoroughly depicted. Moreover, a deeper analysis of the Chinese position as ''world factory'' restructuring over the last two decades is provided, which resulted in a coexistence of export-oriented industry and domestic market-oriented production networks throughout Eastern, Western and Central regions. Then, the study mainly focuses on China's role as a fundamental driver of technological upgrading for the South-East Asia region and on China's digital rise and its attempt to create a balanced data asset ecosystem. In the final chapter, an outlook on and a general description of the Belt and Road - Digital Silk Road Initiative's main objectives and projects are given, alongside a focus on BRI - DSR as a tool for a new China-led Global Regionalism. Alibaba and its initiative for global trade eWTP - electronic World Trade Platform – is then presented as the main case study, since in terms of progress and importance, it shows China's digital and market achievements. This work "argues that the Alibaba's eWTP digital platform is a counter-hegemonic discourse that - based on the economic and technological power of Alibaba and its support of the BRI" and Chinese government - "attempts to globalize" a China-led "global digital trade order to challenge the previous wave of" West-led Globalization and "the existing global trade regime" (Bosetti. R., 2020; Seoane MFV, 2020, p.68,79). As a conclusion, some thoughts on the future perspectives of China's role as a driver of Digital Globalization are shared, in the context of the contemporary geopolitical and market changes (Lund S. and Tyson L., 2018; McKinsey & Company, 2016; Fariselli P., 2020; McKinsey & Company, 2019; Wang H. and Miao L., 2022; ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; UNCTAD, 2022; Chen X., Miao T., and Li X., 2020; The Economist, 26/01/2019; Seoane MFV, 2020; Bosetti. R., 2020).

Chapter 1. Globalization: changing nature

The remarkable increase in cross-border flows of goods, money and ideas that have reconfigured the inter- and intra-national relations and policies during the last thirty years have been crucial within a globalized international market. However, looking at the recent changes that characterize the current global economic and geopolitical scenario, the phenomenon of Globalization is clearly in transition. Indeed, the market tensions, geopolitical rivalries and protectionist measures that have primarily targeted the technology industry (US-China trade war), as well as the severe global economic consequences arising from the Covid-19 pandemic, the global inflation and the Russia-Ukraine military conflict have exacerbated a path that began with the 2007-08 financial crisis, leading to a reaction to the previous scenario that is defined by many as Deglobalization (or Slowbalization). Numerous scholars argue that Globalization has ended, and that international trade has peaked. However, this perspective is incomplete. Indeed, there is compelling evidence to suggest that a new phase of Globalization has emerged, and China is in a unique position to lead the world into the next wave of Digital Globalization. In this first chapter, a general description of major Globalization's trends is made, focusing on Digital Globalization; reshaped GVCs' framework, participation, and power imbalances among economic actors involved. Then, an attempt on measuring the volume and the economic value of data from a business perspective is presented. To conclude, a brief insight on data flows policies, strategies and competition in the international trade regime is made (Fariselli P., 2020; The Economist, 26/01/2019; Lund S. and Tyson L., 2018; ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; Wang H. and Miao L., 2022).

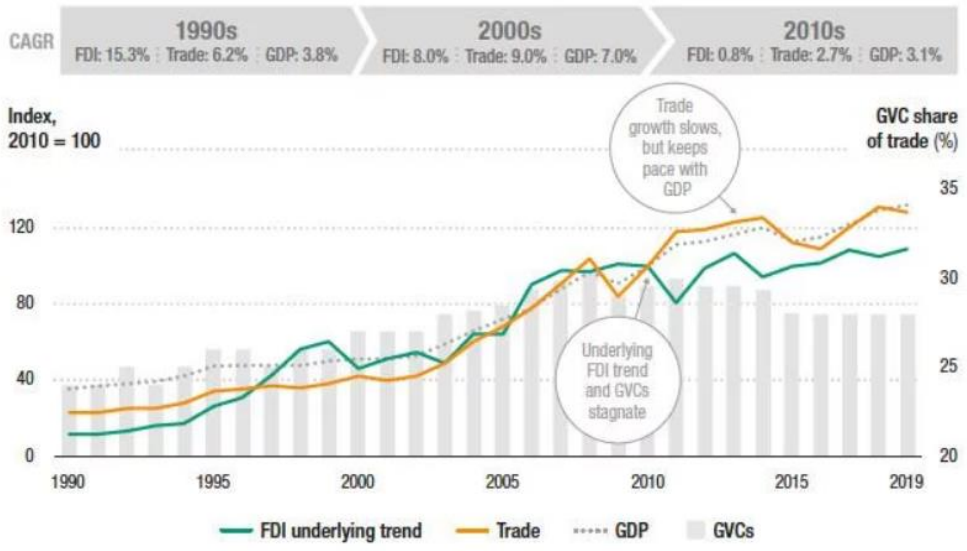
1.1. Globalization

Over the past few decades, the progression of technology and the explosion of data have led to the emergence of Globalization 3.0. The worldwide exchange of goods has evolved from physical to more intangible goods such as education, healthcare, and culture, to now on data, information, technology, and finance (Wang H. and Miao L., 2022).

Particularly, from the 1990s to the global financial crisis of 2008-2009, the world experienced an era of Hyperglobalization, characterized by a significant expansion of Global

Value Chains (GVCs). This growth was mainly due to China's entry into the World Trade Organization and an increase in developing countries' adoption of open strategies. During this period, global gross exports grew by an average of 8.7% per year, and indirect exports grew at a rate of 9.7% between 2000 and 2010. However, the subsequent decade, 2010-2020, saw a dramatic slowdown in both gross and indirect exports[1]. Although Globalization did not reverse, it significantly decelerated, prompting scholars and publications like The Economist to refer to it as the era of Deglobalization or Slowbalization (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; The Economist, 26/01/2019).

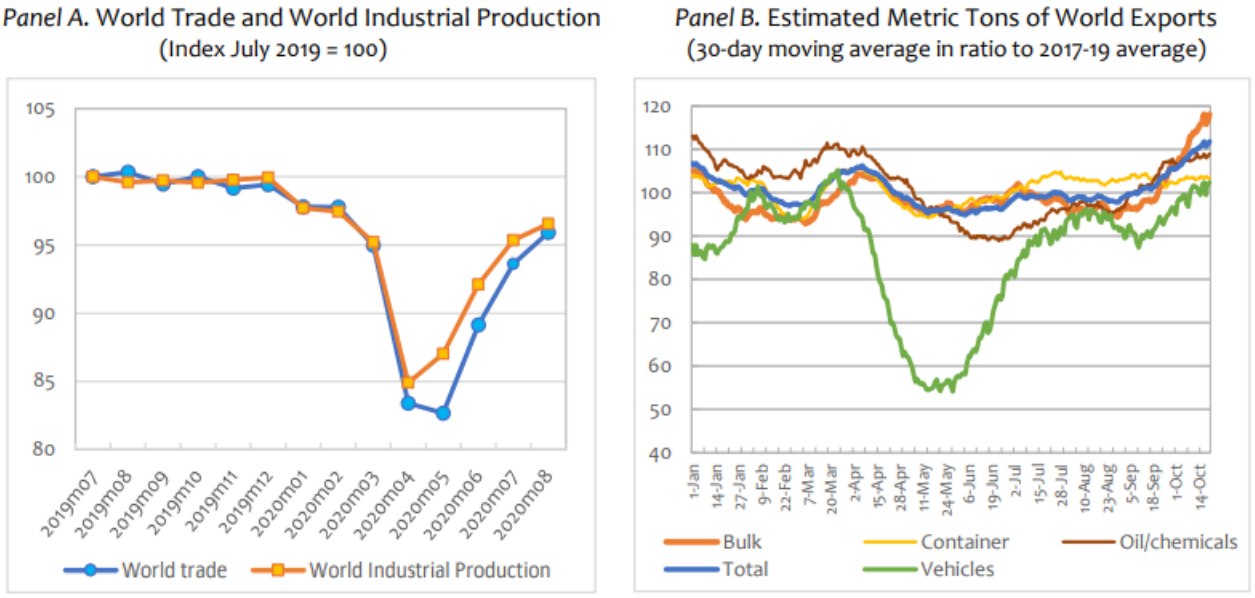
Figure 1.1 The international production trend (1990-2019)



Source: Zhan J., Casella B., Santos-Paulino A., Bolwijn R., 2020

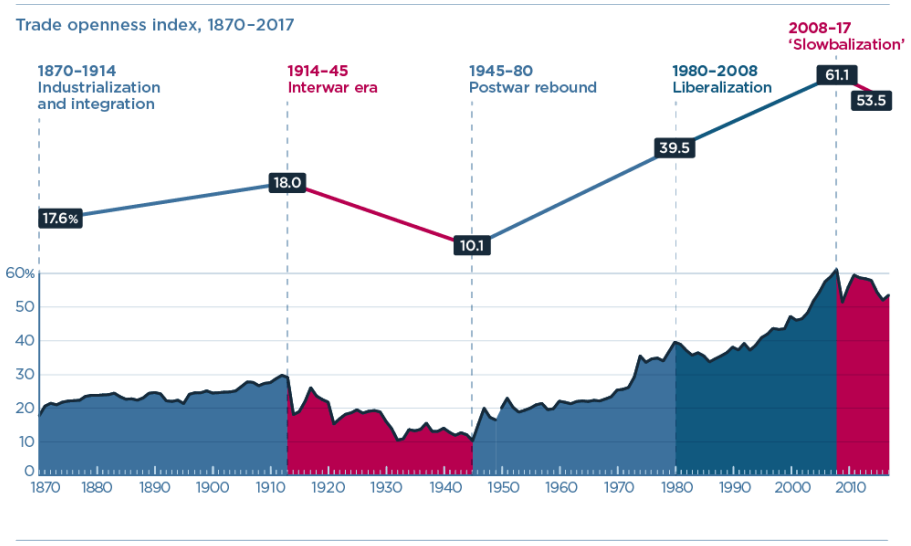
[1] Gross exports slowed to 3.7%, and indirect exports to 3.8%. Indirect exports still grew, but much more slowly than in the era of Hyperglobalization (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021).

Figure 1.2 The Impact of COVID-19 On World Trade



Source: Antràs, P. 2021, p.40

Figure 1.3 Slowbalization



Source: PIIE

Nonetheless, there are more profound changes occurring in the nature of Globalization that have received limited attention. The current discourse concerning the shifting global landscape has introduced new concepts such as friendshoring[2], nearshoring, reshoring[3],

[2] "They refer to adding strategic suppliers in nearby and/or politically friendly countries, reversing a long-standing supply chain trend of offshoring" (https://www.moodysanalytics.com/articles/2023/risks-benefits-of-nearshoring-and-friendshoring, accessed on 07/03/23).

[3] "Reshoring is the process of returning the production and manufacturing of goods back to the company's original country" (https://www.investopedia.com/terms/r/reshoring.asp, accessed on 07/03/23). The process of reshoring will result in shorter and less fragmented value chains, as well as a higher concentration of value added

Regionalization[4], Deglobalization or Slowbalization, diversification[5], and decoupling as predominant themes. Some of these will be discussed in this chapter and in the following one (McKinsey & Company, 2019; Lund S. and Tyson L., 2018; PIIE).

1.1.1. Trends

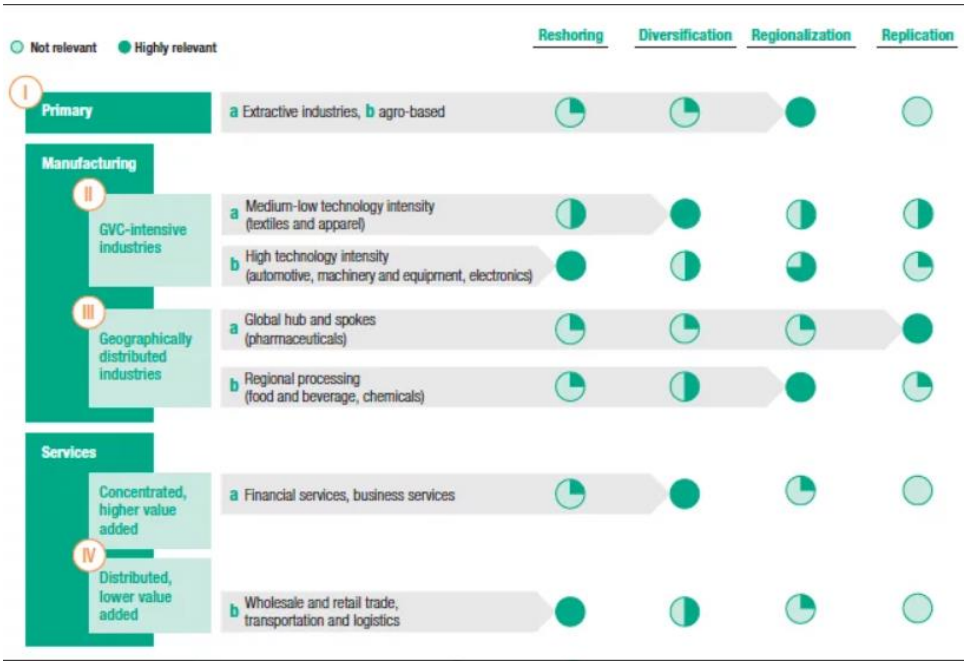
The period of the 1990s and 2000s witnessed the growth of complex Global Value Chains that spanned across the globe, as mentioned in McKinsey & Company (2019).

Figure 1.4 Current GVC configuration and future trajectories

in specific geographic regions. This trend will predominantly affect industries that rely heavily on hi-tech GVC-intensive industries. The implications of this shift may include an increase in divestment and a reduction in foreign direct investment (Zhan J., Casella B., Santos-Paulino A., Bolwijn R., 2020).

[4] "Regionalization is the concentration of economic activities – trade in goods and services, movement of capital and people – within a particular region or country. An indicator of this process is the increase in intra-regional trade as a percentage of world trade and of the region's own trade" (https://kyotoreview.org/issue-4/economic-regionalization-in-east-asia/#:~:text=Regionalization%20is%20the%20concentration%20of,of%20the%20region's%20own%20trade, accessed on 07/03/23). This trend will decrease the physical distance between supply chain participants, but not necessarily reduce fragmentation. This shift will increase the geographic distribution of value-added activities, affecting regional processing industries, some GVC-intensive industries, and the primary sector (Zhan J., Casella B., Santos-Paulino A., Bolwijn R., 2020).

[5] Diversification is expected to result in a broader dispersion of economic activities, particularly in the service and manufacturing sectors that rely heavily on Global Value Chains. This trend will create new opportunities for economies and firms to engage in Global Value Chains. However, the growing reliance on supply chain digitalization may lead to more loosely governed, platform-based, and asset-light value chains (Zhan J., Casella B., Santos-Paulino A., Bolwijn R., 2020).

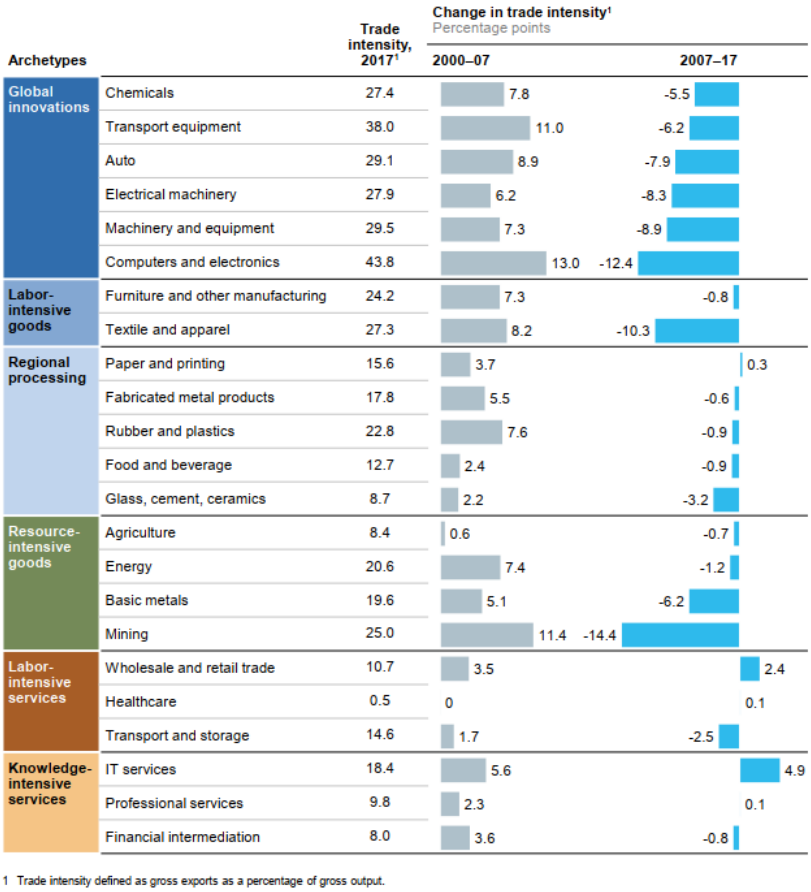


Source: Zhan J., Casella B., Santos-Paulino A., Bolwijn R., 2020

McKinsey & Company (2019) identified five significant changes that have occurred in Global Value Chains in the past decade. These shifts are taking place amidst a backdrop of a scenario of policy uncertainty.

"Goods-producing value chains have become less trade-intensive. Output and trade both continue to grow in absolute terms, but a smaller share of the goods […] is now traded across borders. Between 2007 and 2017, exports declined from 28.1 to 22.5 percent of gross output in goods-producing value chains" (McKinsey & Company, 2019, p. vi; World Trade Organization, 2018).

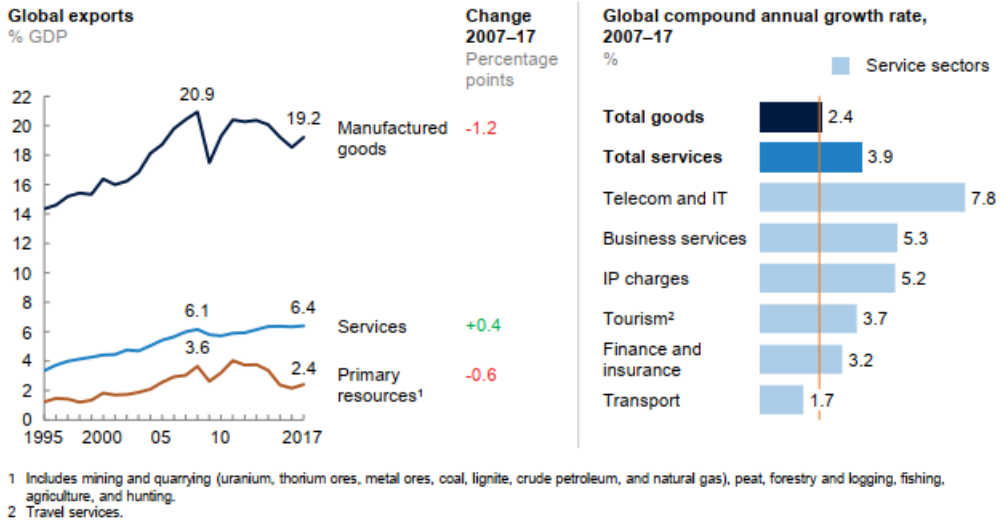
Figure 1.5 Declined trade intensity in almost all goods-producing GVCs (2007-17)



Source: McKinsey & Company, 2019, p.6

"Cross-border services are growing faster than trade in goods, and they generate far more economic value than traditional trade statistics capture" (McKinsey & Company, 2019, p. vi; Miroudot, S. and C. Cadestin, 2017; Mattoo A. et al., 2017; Heuser C., Mattoo, A., 2017). These include three uncounted aspects: the contribution of value-added services to exported goods, the intangible assets that companies send to foreign affiliates, and free digital services available globally.

Figure 1.6 The services trade is increasing faster than trade in goods (2007-17)



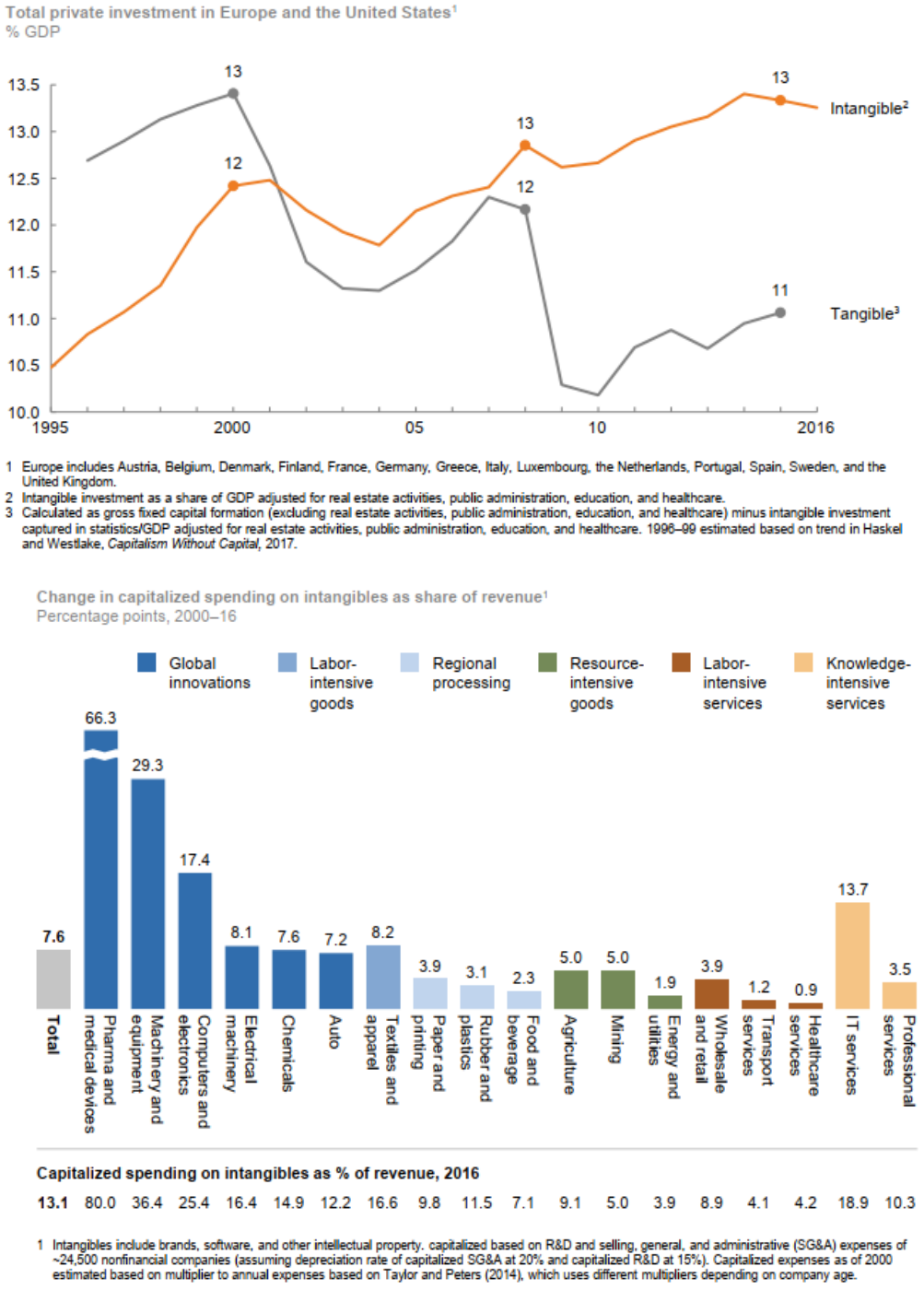
1 Includes mining and quarrying (uranium, thorium ores, metal ores, coal, lignite, crude petroleum, and natural gas), peat, forestry and logging, fishing, agriculture, and hunting.
2 Travel services.

Source: McKinsey & Company, 2019, p.42

Global Value Chains are becoming more knowledge-intensive and rely more on high-skill labor and less on labor-cost arbitrage[6]. Investment in intangible assets, such as research and development (R&D), brands, and intellectual property (IP), has more than doubled as a share of revenue across all value chains since 2000. Upstream activities, such as R&D and design, and downstream activities, such as distribution, marketing, and after-sales services, are increasingly contributing to value creation, while the share of value generated by the actual production of goods is declining (in part because offshoring has lowered the price of many goods). In some industries like pharmaceuticals, footwear, and consumer electronics, virtual manufacturing companies like Apple and Nike have emerged focusing on developing goods while outsourcing production to contract manufacturers and maintaining upstream and downstream functions themselves (Gereffi Gary & Wu Xinyi, 2020; ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; McKinsey & Company, 2019; Haskel J. and S. Westlake, 2017).

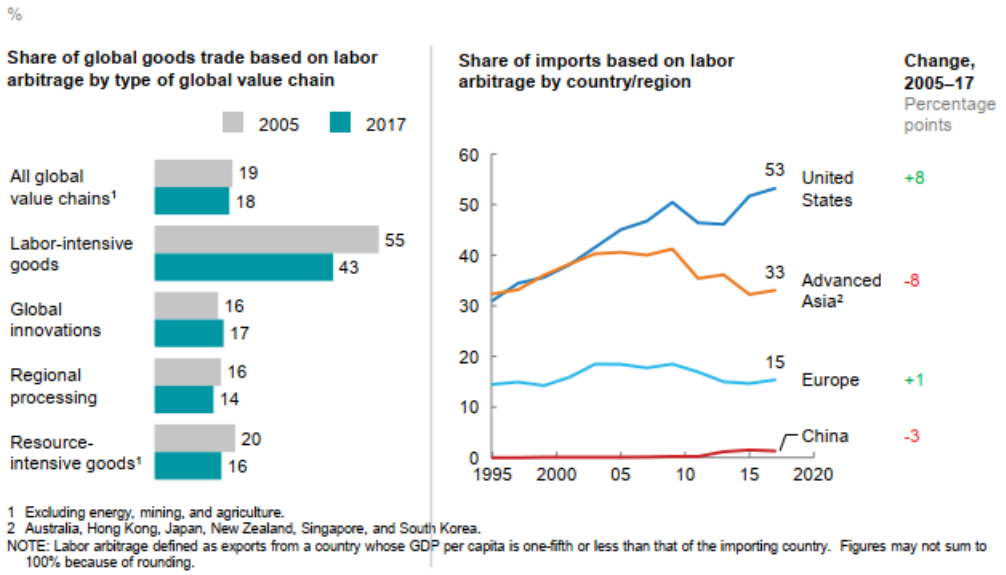
[6] In recent years, the share of trade based on labor-cost arbitrage has decreased in various value chains. This trend has shifted from the period between 1995 and 2005, where exports from low-wage countries to high-wage countries increased across many industries, as manufacturing moved to countries like China. Nowadays, multinational corporations' decisions on plant location consider factors beyond labor costs, such as infrastructure quality, proximity to consumers, energy and transportation costs, labor force skills, and regulatory and legal conditions. Companies respond to increased uncertainty with a range of strategies, including automation, digitalization, diversification, just in time management, Regionalization, nearshoring, and shortening Global Value Chains for some products (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; Lund S. and Tyson L., 2018; McKinsey & Company, 2019).

Figure 1.7 Investment in intangibles and knowledge intensiveness of Global Value Chains (1995-2016)



Source: McKinsey & Company, 2019, p.37, 46

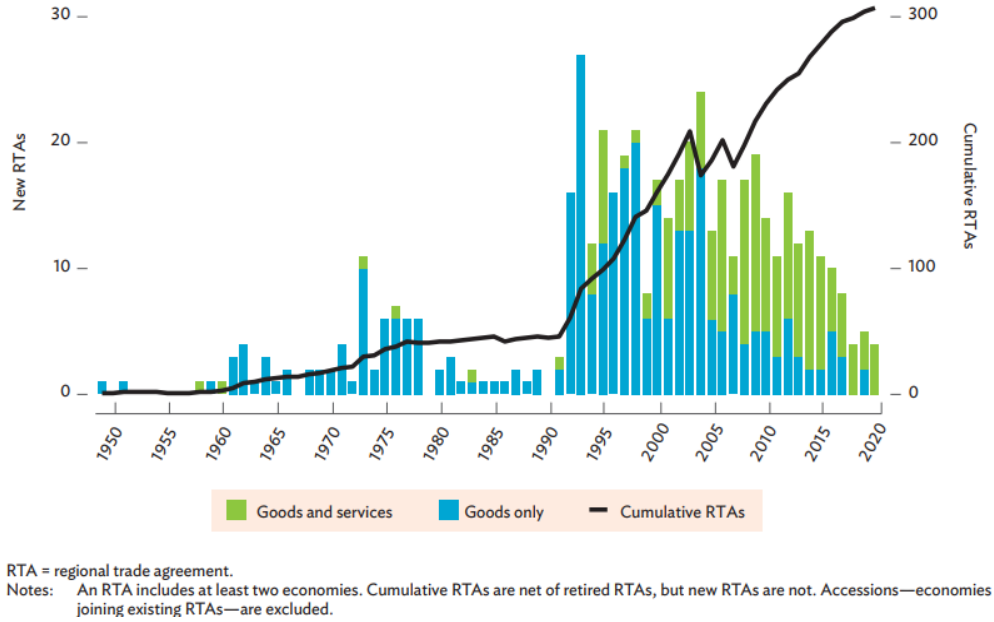
Figure 1.8 The share of global trade based on labor-cost arbitrage (2005-17)

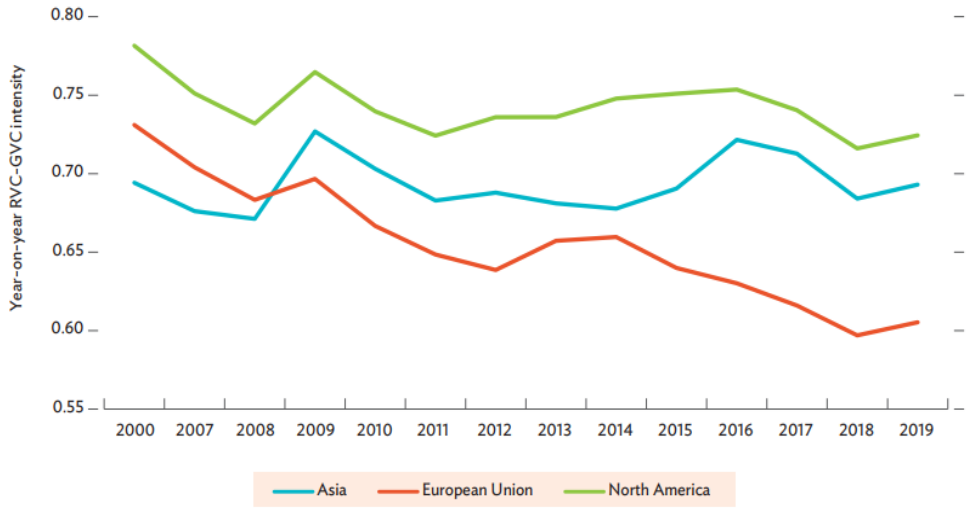


Source: McKinsey & Company, 2019, p.36

"Goods-producing value chains (computers and electronics) are becoming more regionally concentrated, especially within Asia and Europe. Companies are increasingly establishing production in proximity to demand, due to their need for just-in-time management" (McKinsey & Company, 2019, p. vi; ADB, UIBE, WTO, IDE-JETRO, DERF, 2021).

Figure 1.9 Regionalization



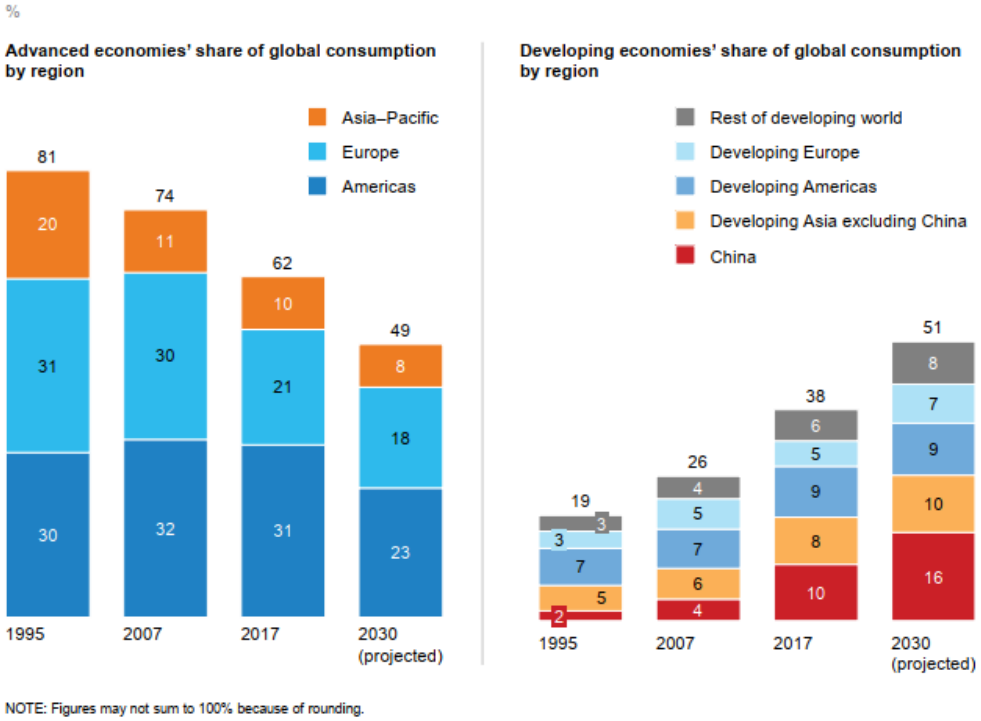


EU = European Union, GVC = global value chain, RVC = regional value chain.
Note: RVC–GVC intensity is the ratio of RVC and GVC participation rates. North America comprises Canada, Mexico, and the United States.

Source: ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.25, 188

The changes witnessed in value chains are attributed to three primary forces. Firstly, the share of global consumption in emerging markets has been on the rise for the past years. China and other developing nations are consuming more of the goods they produce and exporting a lesser portion (McKinsey & Company, 2019; ADB, UIBE, WTO, IDE-JETRO, DERF, 2021).

Figure 1.10 China and emerging Asian countries' global consumption projection (1995-2030)

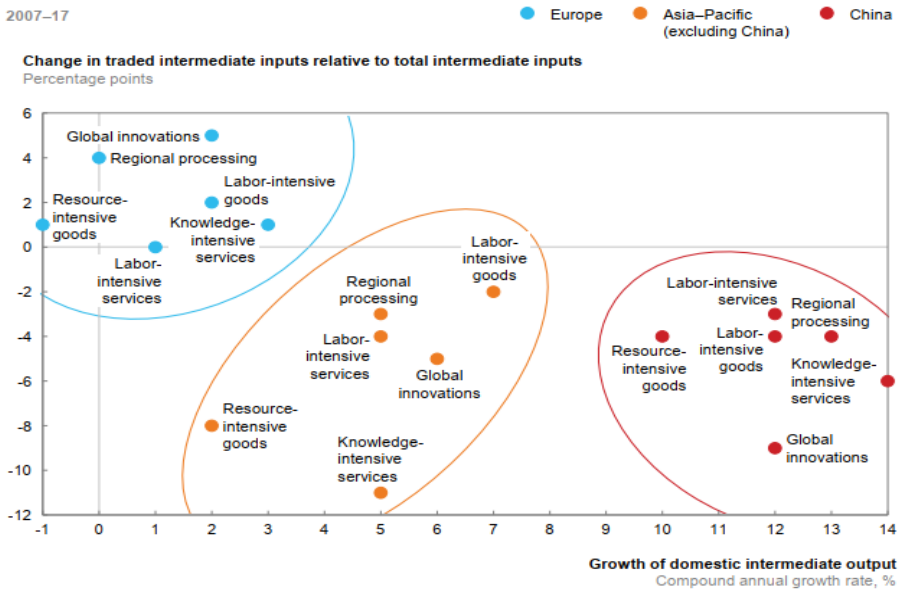


NOTE: Figures may not sum to 100% because of rounding.

Source: McKinsey & Company, 2019, p.11

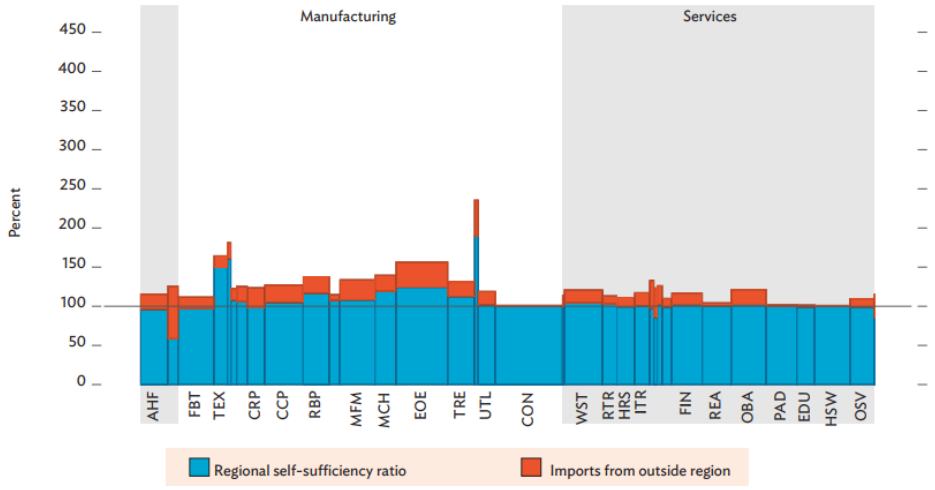
Secondly, emerging economies have attained a new level of industrial maturity by constructing their domestic supply chains and reducing their reliance on intermediate inputs required for factory operations. China is making rapid progress in this area as it modernizes various industries and strengthens its capacity in design, engineering, and high-tech manufacturing. As a conclusion, innovative technologies are transforming trade patterns by reshaping the economics of production, generating new products, and lowering transaction costs (*Ibidem*).

Figure 1.11 China and emerging Asian countries are building domestic supply chains (2007-2017)



Source: McKinsey & Company, 2019, p.68

Figure 1.12 Regional skyline chart – ASEAN+3 bloc (2019)[7]



Source: ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.33

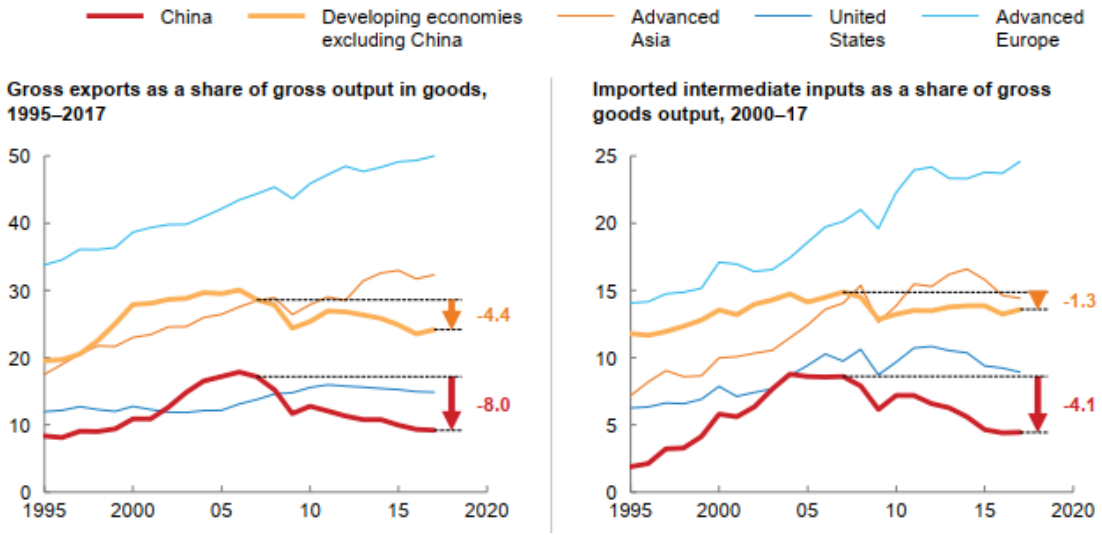
According to recent studies, there is an observable trend of deepening production networks in developing nations, which is evident as local industries become more vertically integrated, and multinationals establish foreign affiliates to cater to the rapidly growing markets. This pattern is evident in several countries, including China, India, and Indonesia. China, which was responsible for the growth of Global Value Chains, has progressed towards constructing more comprehensive domestic supply chains. Initially, it relied on importing intermediate goods and re-exporting assembled products globally in the field of computers and electronics, whereas it is now focused on advancing its indigenous capacity to produce sophisticated chips, which were earlier imported from advanced economies. China is thus moving into higher-value parts of the value chain as it builds a semiconductor and digital industry. Developing more vertically integrated domestic industries enables China to secure more value-added and concurrently create job opportunities and economic growth in its underdeveloped inland provinces (*Ibidem*).

China's expanding domestic supply chains have resulted in a decline in its trade intensity. A similar but less pronounced pattern can be observed in other developing

[7] "A skyline chart visualizes the industrial structure of an economy and the extent to which it relies on imports. Each sector is represented by a "tower," as in the figure. The width of the tower measures the share of a sector in the economy's output. The height of the tower measures output induced by demand for that sector, computed using data from an input–output table. Output induced by domestic demand is normalized at 100%, with anything above corresponding to output induced by export demand. Part of the tower is shaded red to indicate the reduction in output induced by imports, which, being negative, starts from the top of the tower and extends downward. If the blue region of the tower is above the 100% line, then the sector it represents is said to be self-sufficient. That is, its own output is enough to satisfy its induced domestic demand. If it is below the 100% line, domestic output is insufficient and the economy has had to import the shortfall in supply. The actual height of the blue region is called the sector's self-sufficiency ratio" (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.33).

countries. The most substantial decrease in trade intensity was noticed in highly-traded and complex Global Value Chains, including the fields of computers and electronics, electrical machinery, automotive, chemicals, transportation equipment, and textiles and apparel. Nevertheless, the declining trade intensity in goods does not indicate the end of Globalization; instead, digital technologies and data flows are becoming the drivers of the new global economy (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; McKinsey & Company, 2019; Lund S. and Tyson L., 2018).

Figure 1.13 China and other developing economies' trade intensity decrease (1995-2020) (%)

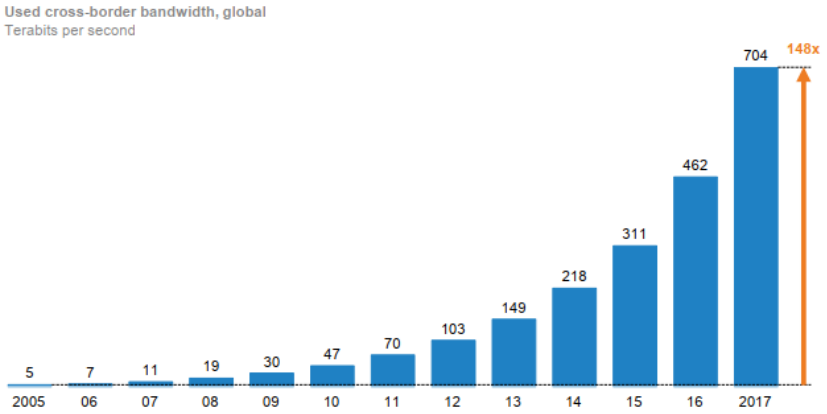


Source: McKinsey & Company, 2019, p.12

Other developing countries are following China's footsteps by undergoing similar structural changes such as expanding into new value chain segments, having strong consumer markets, and establishing more self-reliant domestic industries. Although in its initial stages, the emerging Southeast Asia group of countries is now less dependent on imported intermediate inputs for producing goods than the rest of the developing world (*Ibidem*).

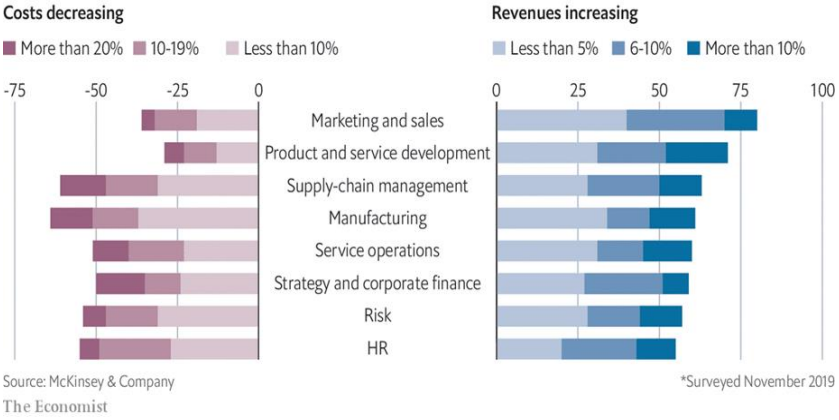
Furthermore, cross-border data flows and new technologies, such as digital platforms, the internet of things, and automation and AI, are transforming Global Value Chains. The rise of digital flows has led some governments to adopt protectionist measures. In 2016, China enacted a law requiring companies to store all their data within Chinese borders, undergo security reviews, and standardize personal information collection, which effectively grants the government access to vast amounts of private data. These and other forms of digital protectionism may impede economic growth, as it will be discussed later on in this section (*Ibidem*; World Trade Organization, 2018).

Figure 1.14 Cross-border data flow increase since 2005 (2005-2017)



Source: McKinsey & Company, 2019, p.72

Figure 1.15 Average cost decrease and revenue increase from AI adoption, % of respondents reporting (surveyed on 2019)



Source: The Economist, 20/02/20

As the costs and risks of global operations change, companies are facing more complex uncertainties, and flexibility and resilience have become critical. Companies must determine where to compete along the value chain, explore new service offerings, and re-evaluate their geographic presence. Speed to market is becoming a significant factor, and many companies are opting to localize their supply chains for better coordination. Rather than keeping their suppliers at a distance, companies can benefit from more collaborative relationships with those that are core to their business (friendshoring and nearshoring) (Pankaj Ghemawat, 2018; Grant E., and Young J., 2017; Zhan J., Casella B., Santos-Paulino A., Bolwijn R., 2020; McKinsey & Company, 2019, p. 17-18). Global companies face several imperatives to thrive in this changing landscape.

"Reassess where to compete along the value chain". Business leaders need to continuously assess where value is shifting in their industry and adapt their strategy

accordingly. Some companies, such as Apple and many pharmaceutical firms, have shifted their focus to R&D and distribution while outsourcing production. Others in consumer goods take a hyperlocal approach, with customized products for individual markets. “Global-local” services like Airbnb and Uber have established global brands, but also rely on extensive local operations. Network companies, which are primarily knowledge-intensive service providers, create value through a geographically dispersed operating model and global reach. Regardless of the strategy, it is crucial for companies to maintain control, trust, and collaboration in all parts of the value chain. Some companies may need to bring more operations in-house (vertical integration), while others may need to re-evaluate their supplier relationships and management (*Ibidem*).

“Consider how to capture value from services”. In various value chains, including manufacturing, services are becoming more valuable, such as software, design, intellectual property, distribution, marketing, and after-sales services. There are advantages to transitioning to services, such as reducing sales cyclicality, generating higher-margin revenue, and facilitating new sales or design concepts through closer engagement with customers. In some cases, entire business models shift from producing goods to delivering services, such as moving from selling vehicles to providing transportation services or transitioning from selling packaged software and servers to selling cloud subscriptions (*Ibidem*).

“Reconsider their operational footprint to reflect new risks”. Locating operations and investing in new capacity are critical decisions that companies face. However, the factors that drove these decisions in the past have changed. With the emergence of new automation technologies, changing costs of production, increasing risks, and the need for efficiency and speed, many goods-producing value chains are regionalizing. Hence, it may be more advantageous for companies to place production in or near major consumer markets worldwide. Before investing, companies should carefully assess the full range of factors, including risk-adjusted, end-to-end landed costs, which many companies currently do not consider thoroughly (*Ibidem*).

“Be flexible and resilient”. Currently, businesses encounter a more complicated and uncertain environment as the global structure established after World War II appears to be shifting. The potential for increasing tariffs and non-tariff barriers raises concerns of a reversal of the trend toward liberalization of international trade that persisted for decades (*Ibidem*).

“Prioritize speed to market and proximity to customers”. In today's world,

companies have access to detailed sales and consumer behavior data in real-time. However, it requires excellence in manufacturing and distribution to make the most of this data. Speed to market helps companies respond quickly to customer demands and avoid product waste due to forecasting errors. This does not necessarily mean that companies need to relocate manufacturing or fully integrate vertically in every major market. They can instead adopt a strategy of postponement, where they create a standardized product at a distance and add custom touches at a facility near the end market (*Ibidem*).

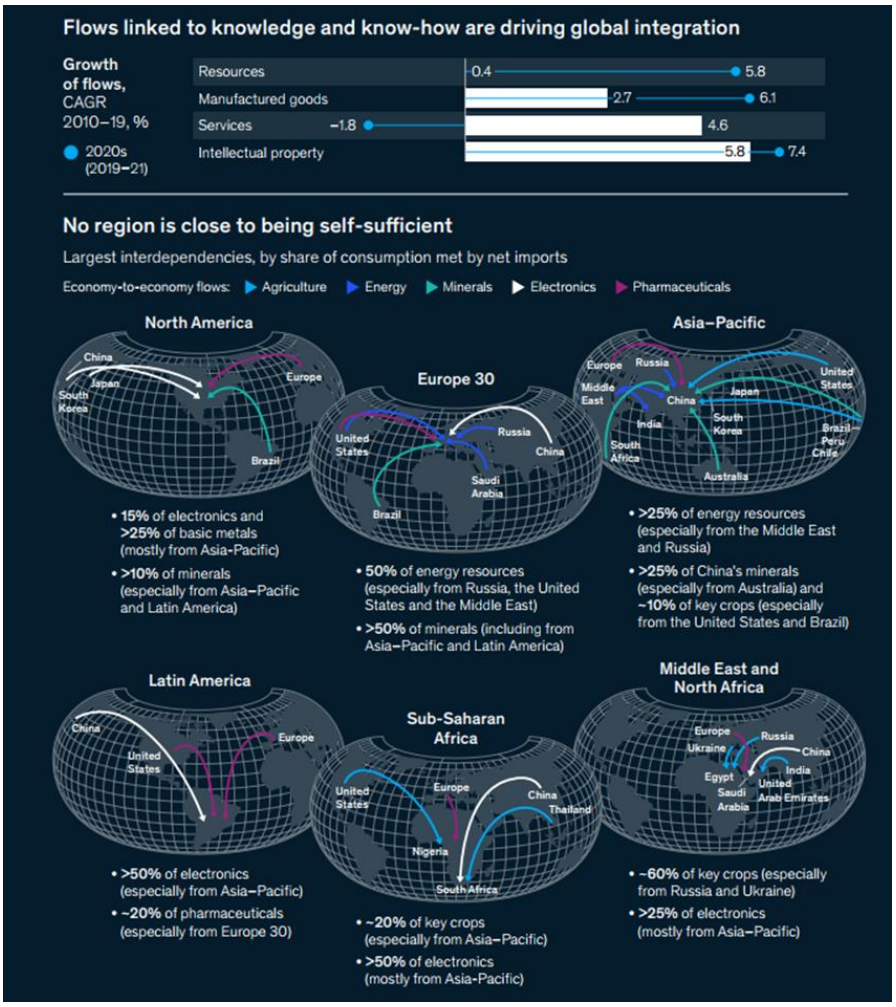
"Build closer supplier relationships". During the previous phase of Globalization, companies tended to fragment their value chains and relocate operations overseas, leading to more distant relationships with suppliers. However, this strategy came with hidden costs and risks. To mitigate and diversify these risks (diversification), companies should identify key suppliers and foster more collaborative relationships with them. As the supply chain contributes an increasing share of the product value, companies that collaborate with their suppliers can gain preferred customer status and access new product ideas and process improvements. By improving labor and environmental standards, larger companies can also bring about systemic changes throughout the value chain. Optimizing supply chains through logistics and production technologies requires end-to-end integration. To fully realize the benefits, larger firms may need to help their small and medium-sized suppliers upgrade their digital capabilities (*Ibidem*).

In summary, the concept of Globalization has not been replaced by Deglobalization or Slowbalization but has instead transitioned into a new phase. Simultaneously, Global Value Chains are transforming and will undergo a significant shift in the next decade due to rising demand in developing nations, the development of more comprehensive supply chains in China and other developing economies, and the emergence of next-generation technologies. These changes will have implications for the competition among companies, and this new scenario presents an opportunity for countries and regions to develop new specializations and roles in value chains. However, policy makers must address potential disruptions that may result from this new wave of Digital Globalization, including market tensions, geopolitical rivalries, protectionist measures, and the economic consequences of the Covid-19 pandemic, global inflation, the Russia-Ukraine military conflict, and the need for sustainability. The shift towards greater supply chain resilience will drive these changes (Fariselli P., 2020; The Economist, 26/01/2019; Lund S. and Tyson L., 2018; ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; Wang H. and Miao L., 2022).

1.1.2. Digital Globalization

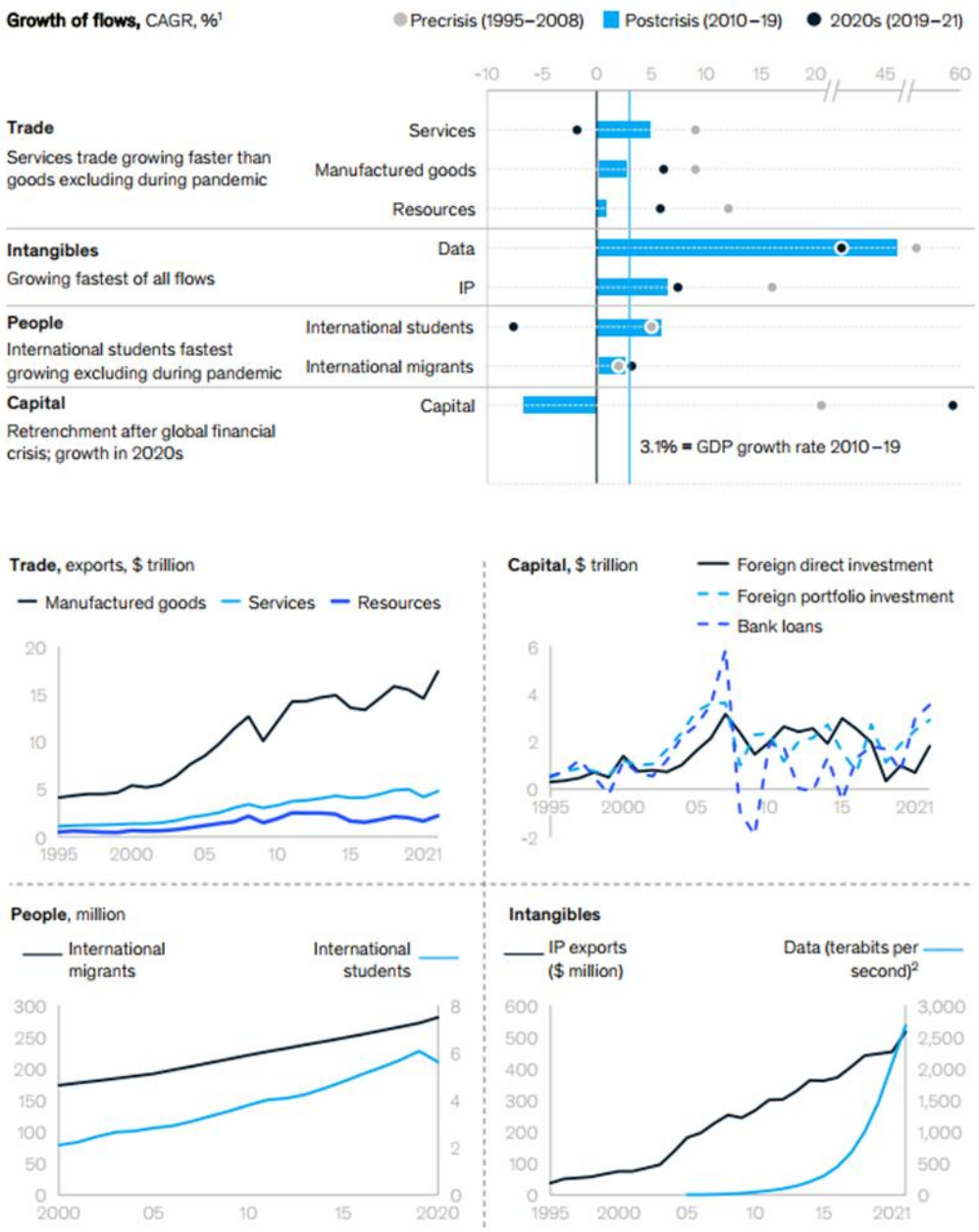
The flows of international trade that increased during the 20th century have slowed down since 2008. However, this does not indicate a reversal of Globalization. Rather, digital flows have grown rapidly, both in terms of volume and variety, allowing for the transmission of information and ideas across the globe. This has resulted in broader participation in the global economy, increased innovation, competition, and productivity.

Table 1.2 Global flows in an interconnected world



Source: McKinsey & Company, 2022, p. v

Table 1.3 Flows of intangibles, services, and students are now driving global integration[8]



Source: McKinsey & Company, 2022, p.5

[8] "Flows of trade, people, capital, and data bind the world together, as MGI has documented since the early 2010s. That research discussed a shift in the relative importance of these flows, highlighting the increased importance of flows of data and intangibles. Over the past decade, newer flows linked to knowledge and know-how have decisively come to the fore. The fastest-growing flows are now data, services, intellectual property (IP), and international students. They have picked up the baton from manufactured goods, resources, and capital— the primary drivers of global interconnectedness over the 20 years before the global financial crisis. Between 2010 and 2019, cross-border data flows increased at a staggering 45 percent annual rate, growing from about 45 to 1,500 terabits per second. Over the same period, flows of services, IP, and international students grew at a more modest pace, but still at around 5 to 6 percent a year, about double the pace of growth of goods trade. The number of highly qualified migrants has risen markedly faster than overall migration" (McKinsey & Company, 2022, p.4).

Digitally speaking, the world has never been more linked. “Emerging economies are counterparts on more than half of global trade flows […], and South-South trade is the fastest-growing type of connection” (McKinsey & Company, 2016, p. vi, 59). Moreover, cross-border bandwidth usage has increased dramatically since 2005, and it is projected to increase even more in the future.

Digital platforms[9] have revolutionized the economics of international commerce, reducing the price of international interactions and transactions. They have developed more efficient and transparent global marketplaces and user communities, offering enterprises with a vast pool of potential customers and effective means to reach them, as well as fostering the direct participation of micro-multinationals and individuals in global commerce as it will be discussed later on. The size of these platforms, combined with their use of automated processes driven by algorithms, lowers the marginal costs for platform operators practically to zero. Platforms make it possible for users to research products, services, prices, and alternative choices. This removes some information asymmetries so that markets function more efficiently, although it may disrupt traditional intermediaries in the process (*Ibidem*; OECD, 2019; Wang H. and Miao L., 2022).

Over the past decade, global flows have contributed to a minimum 10 percent increase in world GDP, amounting to $7.8 trillion in 2014 alone. In this context, data flows now account for a larger proportion of this impact than global trade in goods. Global flows primarily boost economic growth by enhancing productivity, with countries benefiting from both inflows and outflows. The MGI Connectedness Index provides a comprehensive analysis of the extent to which countries engage in inflows and outflows (global flows) of goods, services, finance, people, and data. The Index reveals that advanced economies tend to be more interconnected than developing nations, with the frontrunners significantly ahead of other countries (*Ibidem*).

[9] “Digital platforms include e-commerce marketplaces, operating systems (such as Google’s Android and Apple’s iOS), social networks (such as Facebook, Instagram, Twitter, WeChat, and QQ), and digital media platforms (such as YouTube, Uvideos, Spotify, Hulu, and Netflix). Virtual global marketplaces now match job seekers with employers (LinkedIn), freelancers with assignments (Upwork), borrowers with lenders (Kiva), creative projects with funders (Kickstarter), travelers with accommodations (Airbnb), and students with education providers (Khan Academy)” (*Ibidem*, p.33).

Figure 1.16 MGI Connectedness Index (2014)

Country connectedness index and overall flows data, 2014
Rank of participation by flow as measured by flow intensity and share of world total

Connectedness index rank: 1–10 | 11–25 | 26–50 | >50 Flow intensity: 100+ | 70–99 | <70

Rank	Country	Score	Connectedness Index rank					Flow value[1] $ billion	Flow intensity[2] % of GDP
			Goods	Services	Finance	People	Data		
1	Singapore	64.2	1	2	2	12	6	1,392	452
2	Netherlands	54.3	3	3	6	21	1	1,834	211
3	United States	52.7	7	7	3	1	7	6,832	39
4	Germany	51.9	2	4	8	3	2	3,798	99
5	Ireland	45.9	32	1	1	28	9	559	227
6	United Kingdom	40.8	13	5	5	6	3	2,336	79
7	China	34.2	4	16	4	82	38	6,480	63
8	France	30.1	11	8	9	7	4	2,262	80
9	Belgium	28.0	5	6	33	33	8	1,313	246
10	Saudi Arabia	22.6	20	28	27	2	53	790	106
11	United Arab Emirates	22.2	6	23	17	4	46	789	196
12	Switzerland	18.0	12	11	10	17	13	848	115
13	Canada	17.3	16	22	11	11	18	1,403	79
14	Russia	16.1	21	25	18	5	25	1,059	57
15	Spain	14.4	25	13	19	14	16	1,105	79
16	Korea	14.0	8	12	28	50	44	1,510	107
17	Italy	13.4	17	18	24	16	19	1,587	74
18	Sweden	13.0	29	14	22	31	5	572	100
19	Austria	11.7	26	17	31	20	12	470	108
20	Malaysia	11.6	9	19	25	26	43	610	187
21	Mexico	10.7	14	63	34	18	41	1,022	80
22	Thailand	10.7	10	15	36	44	64	605	162
23	Kuwait	10.6	37	46	13	13	75	306	153
24	Japan	10.5	15	20	12	81	20	2,498	54
25	Kazakhstan	10.0	48	73	41	8	57	176	83
26	Ukraine	9.8	38	39	87	10	34	133	101
27	Australia	9.7	30	34	21	15	33	825	57
28	Denmark	8.9	35	9	32	41	11	369	108
29	Jordan	8.8	73	50	75	9	83	50	138
30	India	8.5	24	10	35	58	70	1,316	64
32	Czech Republic	7.5	18	33	57	59	15	397	193
34	Poland	7.0	23	31	47	34	22	585	107
35	Hungary	6.8	22	30	26	62	17	287	209
36	Norway	6.0	36	24	20	46	24	458	92
37	Vietnam	5.7	19	54	45	103	61	350	188
39	Finland	5.5	46	27	23	70	10	390	144
40	Portugal	5.5	47	36	30	23	31	255	111
41	Turkey	5.1	28	40	53	38	29	521	65
43	Israel	4.9	51	32	49	24	56	248	82
44	Brazil	4.5	41	38	14	125	30	869	37
45	Chile	4.1	45	58	16	102	27	239	92
47	Greece	4.1	60	29	54	35	42	160	67
48	New Zealand	3.9	67	48	61	25	51	130	63
51	Indonesia	3.4	31	49	38	106	76	504	57
53	South Africa	3.3	34	57	52	64	80	277	79
54	Philippines	3.2	54	41	44	52	67	230	81
64	Morocco	2.6	58	43	74	56	65	104	97
73	Egypt	2.2	68	42	69	73	71	158	55
83	Nigeria	1.9	55	76	48	128	98	268	47
86	Peru	1.8	62	88	51	104	49	122	60
118	Kenya	1.3	100	84	127	119	91	35	58

1 Flows value represents total goods, services, and financial inflows and outflows.
2 Flow intensity represents the total value of goods, services, and financial flows as a share of the country's GDP.

Source: McKinsey & Company, 2016, p.57

According to UNCTAD[10], the global trend in e-commerce sales implies that more countries are participating in the global economy. However, global flows of e-commerce sales are unevenly distributed and tend to concentrate among a few leading countries and regions. In 2019, the top 10 countries with e-commerce sales, from Asia, Europe, and North America, accounted for 80% of global e-commerce sales. This geographic concentration is attributed to

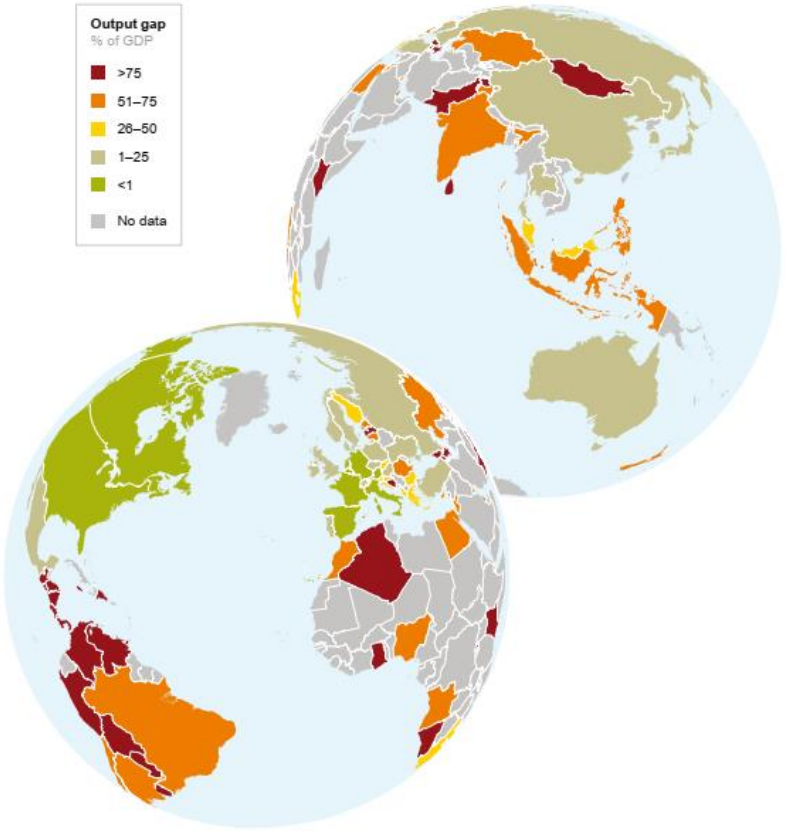
[10] UNCTAD 2021 in ADB, UIBE, WTO, IDE-JETRO, DERF, 2021.

factors such as digital infrastructure, Internet access, and digital skills, which are more widespread in these regions. Despite the installation of global telecommunication equipment growing, it is not distributed evenly worldwide. The gap between leading countries and others is slowly closing, but developing countries still can catch up.

Beyond countries, other economic actors, such as cities, regions within countries, and larger blocs of nations, are increasingly engaging with the global economy in diverse ways and to varying extents. Analyzing these entities through different lenses offers distinctive perspectives on the emerging trends of Digital Globalization (for more information see McKinsey & Company, 2016).

According to McKinsey & Company (2016), countries on the periphery of the global network can benefit more from data flows in terms of GDP growth compared to countries at the center. Developing countries can increase their participation in global flows by trading with neighbors, expanding Internet access, and implementing secure and open data frameworks.

Figure 1.17 Countries on the periphery of the global network can benefit from data flows in terms of GDP growth



Source: McKinsey & Company, 2016, p.82

Data flows provide access to global knowledge, information, and innovation, which can have a greater impact on the GDP growth of economies that have been relatively isolated. In contrast, restrictions on data flows may have a negative impact on GDP growth. This suggests that digitization and digital platforms can play a crucial role in boosting[11] the economic growth of less advanced economies (*Ibidem*; OECD, 2019; Wang H. and Miao L., 2022).

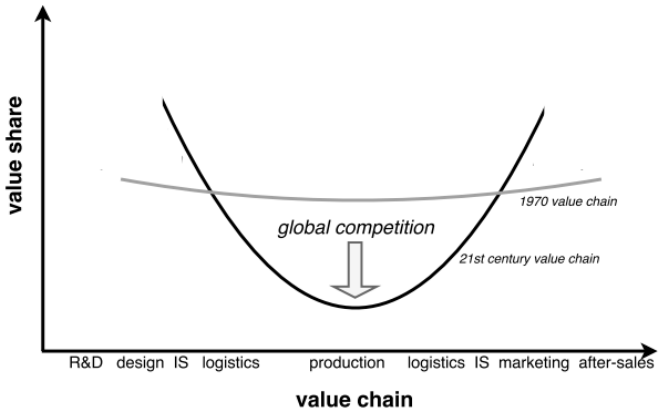
To conclude, the emerging Digital Globalization has the potential to bring about economic and social advantages, such as enhanced productivity and innovation, greater access to information, and broader global connections among consumers and suppliers. However, it may also cause disruption and create opportunities for locations that can efficiently establish infrastructures, institutions, and business environments. Furthermore, with the explosion of data, the management of data algorithms and global information exchange will play a critical role in shaping the future global scenario. While the benefits of this development are significant and tangible, it is important to acknowledge that this scenario will be disruptive (Wang H. and Miao L., 2022; Lund S. and Tyson L., 2018; McKinsey & Company, 2016).

1.2. GVC evolution – from Global Value Chain to Digital Value Chain

The analysis of Global Value Chains (GVCs) has traditionally focused on the production of tangible goods, while "the great expansion of GVCs - a driving force of Globalization - is often attributed to the drop in value added from fabrication and assembly and the relative rise in value added coming from pre- and post-fabrication activities, including design, R&D, marketing, finance and after-sales service" (Durand C. & Milberg W., 2018, p.3). This situation is illustrated by the shift from a relative flat one to a steeper one Smiling Curve "across the full process of producing value" since the 1970s (Durand C. & Milberg W., 2018, p.3).

[11] Many policymakers are considering how their countries should be involved in the current digital global economy. Some of these policymakers are creating barriers to allow domestic platforms providers to develop. However, some scholars (McKinsey & Company, 2016) have shown that countries can benefit from both receiving and producing cross-border digital flows, and it is not necessary to become digital content or platform producers to reap the benefits of data flows.

Figure 1.18 The Smile Curve, 1970 vs 21st century



Source: Durand C. & Milberg W., 2018, p.3

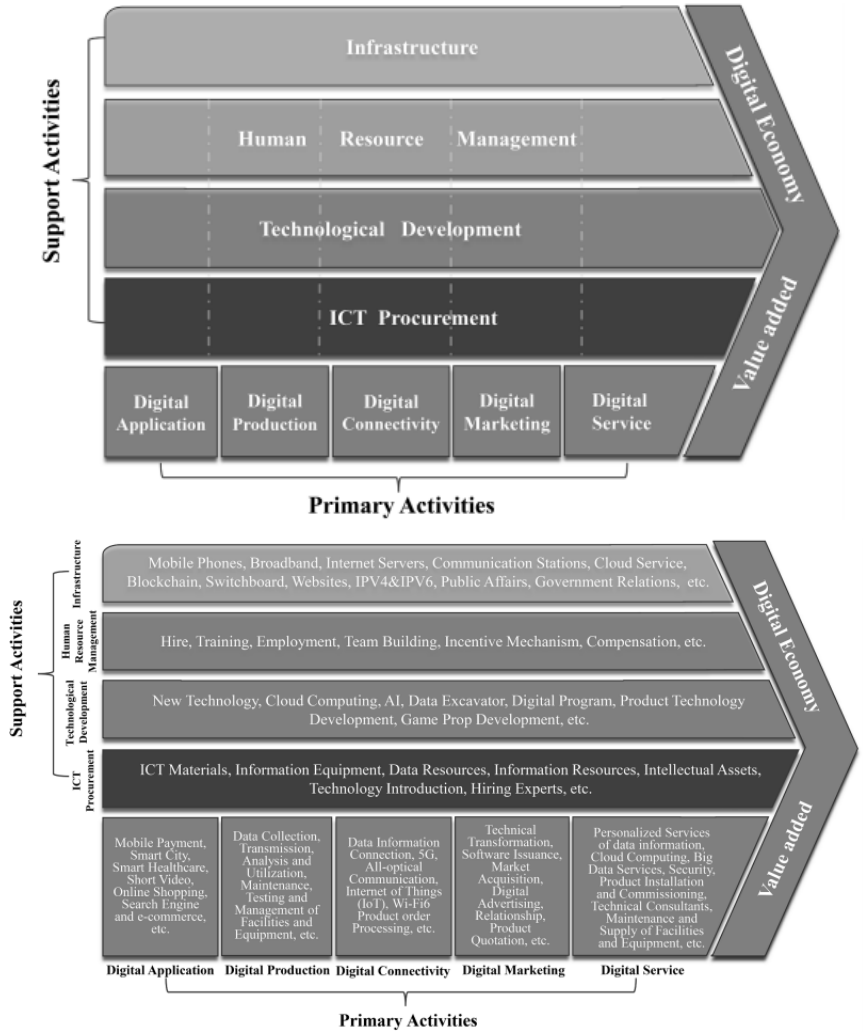
The focus of this section is on the increasing importance of intangibles within GVC structures and on lead firms' efforts to gain market power by monopolizing the production and provision of these assets. Durand and Milberg (2018) draw upon the notion of intellectual monopoly to explain this phenomenon, extending it to the concept of information rents[12] that emerge from scale economies and network externalities associated with the creation of intangible assets. The analysis of intellectual monopoly is contextualized within the realm of international trade, with the GVC framework offering a suitable means to study the impact of intellectual property rights and intangibles-related network dynamics on market structures and the global distribution of value-added (Pagano, 2014; Foley, 2013).

1.2.1. Conceptual framework

According to Durand and Milberg (2018), the value captured in GVCs is primarily related to intangible aspects of the supply chain, rather than the flow of physical goods, thus revealing that a growing concentration of intangible assets lies in lead segments of the supply chains, particularly in the distribution stage for buyer-driven GVCs and in activities before the final production stage for producer-driven GVCs (Timmer et al., 2014). Therefore, Durand and Milberg (2018) suggest that the economic dynamics of GVCs are increasingly dependent on intangible assets (as it will be discussed later on) and many other scholars (Miao Z., 2021) conceptualize an evolution towards a Digital Value Chain.

[12] "Economic rent can be broadly defined as income derived from ownership or control over a limited asset or resource" (https://www.ucl.ac.uk/bartlett/public-purpose/research/economic-rents, accessed on 07/07/23).

Figure 1.19 Digital Value Chain structure



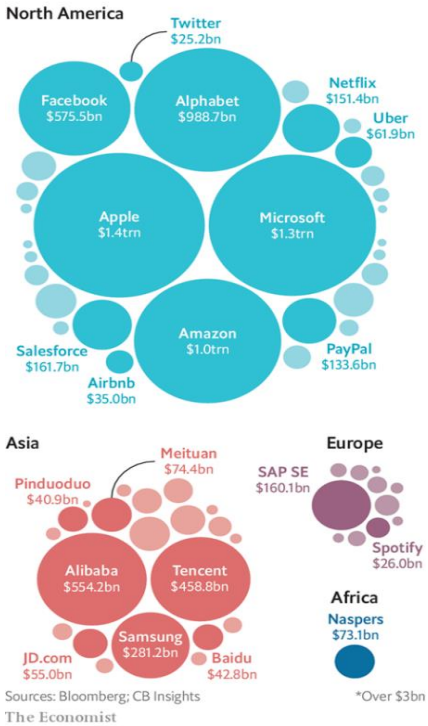
Source: Miao Z., 2021, p.4347, 4349

"Intangibles are nonfinancial assets that lack a physical substance, are non-rival in consumption and are at least partially appropriable. Computerized information, technological know-how, artistic original arts, design and new products, brands, employer-provided training and organizational structure are among the main kind of intangibles" (Durand C. & Milberg W., 2018, p.5).

The increasing importance of intangible assets is constrained by the expansion of intellectual property rights (IPRs) regulations, which restrict their usage in production and consumption. IPRs include copyrights on artistic and scientific works, industrial property like trademarks, and patents on new inventions, giving legal ownership to control the use of the described intangibles to their sole legal owner. While not all intangibles are covered by IPRs, their scope has expanded over time.

Intellectual monopoly is defined as "the power of producers of ideas to control how their products are used" (Durand C. & Milberg W., 2018, p.5-6). The tightening of property rights through intellectual property regulations has led to the emergence of intellectual monopoly capitalism, where producers of ideas have legal control over their products. This has resulted in significant consequences, including unequal distribution of intellectual property rents and a slowdown in firm investment in innovation. The issue of intellectual monopoly extends beyond intellectual property and includes the economics of intangibles. The emergence of natural monopoly market structures, which arise from scale economies (due to high fixed costs and low or zero variable costs), and network externalities and complementarities, occurs in internet companies operating in multiple-sided markets. Facebook, Google, and Amazon in the US, and Tencent and Alibaba in China alongside other internet and digital platforms enjoy significant economies of scale, and once they establish themselves, the cost of expanding to a vast number of customers is minimal. This is further reinforced by the fact that consumers derive significant benefits from using a single platform, which implies that these firms tend towards natural monopolies[13].

Figure 1.20 Selected global platforms, market capitalization (February 1st, 2020)



Source: The Economist, 20/02/20

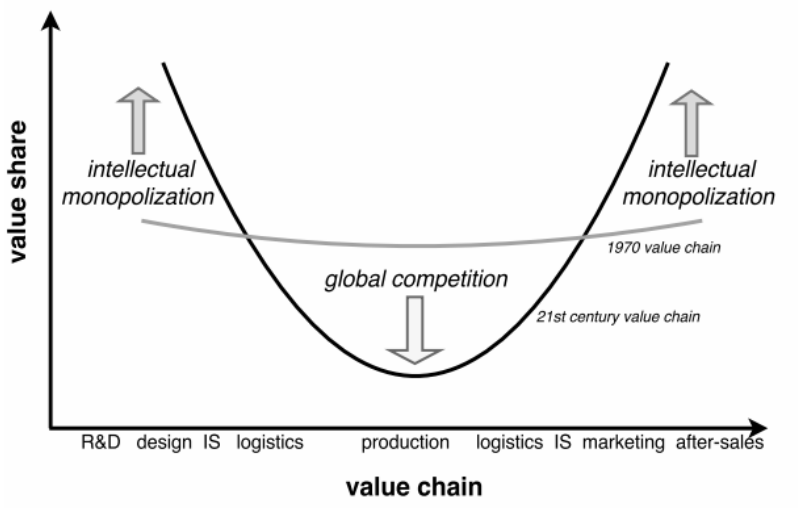
[13] "A natural monopoly is a type of monopoly that arises due to unique circumstances where high start-up costs and significant economies of scale lead to only one firm being able to efficiently provide the service in a certain territory" (https://www.investopedia.com/terms/n/natural_monopoly.asp, accessed on 07/03/23).

Intellectual monopoly also extends beyond internet companies, and it has been acknowledged that the ICT revolution played a part in Globalization and GVCs expansion. This revolution enabled Globalization by improving communication, which meant that manufacturing processes could be spread internationally with minimal efficiency losses. However, increased fragmentation and spatial dispersion of the production process led to the need for coordination. To achieve GVC optimal management, there must be a dense circulation of information flows to communicate specifications, standards, technical know-how, as well as costs and other items. Therefore, the expansion of GVC trade is linked to a rising circulation of intangible assets (*Ibidem*; Gereffi, 2005; Baldwin, 2016).

According to Durand and Milberg (2018), the existence of oligopolistic lead firms with markup pricing power, along with intense competition among lower-tier suppliers, creates a polarization and asymmetry in market structures. Global competition plays a central role in this, as more developing countries enter lower- and medium-tech industries in manufacturing and services, lead firms can induce competition among their suppliers, offload productive risks to them and pit them against one another.

The Smile Curve illustrates how the value-added share is distributed in GVCs, with global competition deepening the curve and limiting value capture at the central assembly segment of the product formation. Intellectual monopoly reinforces this deepening but instead of lowering pressure in the middle, it pushes upward pressure at both ends of the curve where control of intangible assets is concentrated. The growing role of intangible assets in chain dynamics and tighter IPRs create this upward pressure. Lead firms' market power is enhanced by intellectual monopoly, which is fueled by dynamic advantages from GVC centralized network externalities, increasing returns on intangibles, and legally enforced proprietary control over standards, technologies, and brands (*Ibidem*; Gereffi, 2005; Baldwin, 2016).

Figure 1.21 Intellectual monopoly vs global competition in the Smile Curve



Source: Durand C. & Milberg W., 2018, p.9

The need for protecting intellectual property (IP) stems from market failures that arise due to the unique nature of knowledge. Since knowledge is indivisible, it presents a free-riding problem whereby everyone can access its benefits, but only the actors that innovated bears the costs. This can lead to underinvestment in knowledge and innovation. However, many studies (*Ibidem*) suggest that stronger IPRs result in increased trade. This supports the idea that GVC trade and stricter IPRs mutually reinforce each other, as discussed below.

1.2.2. Complementarity between GVC trade and IPRs

Starting in the 1990s, GVC trade grew quickly while industrialized nations incorporated intellectual property regulations in trade agreements. During this period, the largest economies and their neighbors saw a significant rise in the share of foreign value added in exports, except for China, which experienced a decrease over the latter part of the period, indicating that it was able to capture more value domestically. In the late 20th century, the expansion of GVC trade and internationalization of IPRs were linked by the growing importance of intangible assets in international trade in order to coordinate production across countries. This scenario carries a risk[14] of knowledge appropriation by competitors, which

[14] To avoid the risk of losing control over their proprietary intangible assets, companies can take several measures. For example, they can keep some production in-house or limit the flow of new intellectual property into countries with weak legal protections. They can also carefully select their suppliers to minimize the risk of intellectual property leaks. Additionally, they can implement Corporate Social Responsibility plans to enforce

prompts lead firms in GVCs to balance the benefits of cost reduction with the potential loss of control over their intangible assets (Durand C. & Milberg W., 2018).

In order to prevent the risk of IP appropriation due to international production fragmentation, lead firms involved in GVC trade seek tighter IPRs in trade agreements. This can also deepen GVC trade by encouraging innovative firms to engage in GVC transactions without the fear of losing control over their own innovations. However, innovative firms' efforts to safeguard their intellectual property in GVCs may conflict with the interests of actors from developing countries. Developing countries' businesses and governments see dense GVC linkages as a potential source not only of market access but also of knowledge transfer (*Ibidem*).

Therefore, the relationship between GVC trade and stricter IPRs on developing countries seems unclear. On one hand, stronger IPRs can contribute to a denser circulation of intangibles within GVCs, increase opportunities for developing countries to learn from better-performing firms and upgrade their productivity (knowledge spillover and upgrading). On the other hand, stronger IPRs can limit the ability of developing country firms to appropriate knowledge, create entry barriers, and increase IP payments, thus strengthening the monopoly power of lead firms in industrial countries while harming less developed ones. Although there is no empirical evidence of the net impact of these effects, Durand and Milberg (2018) suggest that the negative effects are likely stronger.

1.2.3. Monopolization dynamics

The tighter international intellectual property regulations that have come with the expansion of Global Value Chains have led to intellectual monopoly, which is mostly driven by the centralization of network externalities. Three main mechanisms contribute to this process: the capture of the gains from complementarities, the collection of data produced by the activities across the value chain, and the uneven distribution of returns to scale (Durand C. & Milberg W., 2018).

In Global Value Chains (GVCs), each component's value is enhanced through its combination with other components, including conception and development, production,

stricter intellectual property rights standards along the chains and foster a culture of intellectual property protection and compliance throughout the global supply chain (*Ibidem*).

assembly, logistics, marketing, branding, sales, and service. The network nature of the GVC facilitates this value creation (network complementarities). The coordination and standardization required to achieve optimal coordination is overseen by lead firms, which take responsibility for providing the network with an organizational integration framework. As a result, lead firms hold a unique position compared to other participants. Since the firms that coordinate the chain enable other participants to engage in the network and increase the value and/or volume of their activities, they can benefit disproportionately from the value creation that results from network cooperation. This is due to the natural monopoly characteristics (combination of sunk and irreversible costs and network effects) that protect the integrator market power (*Ibidem*).

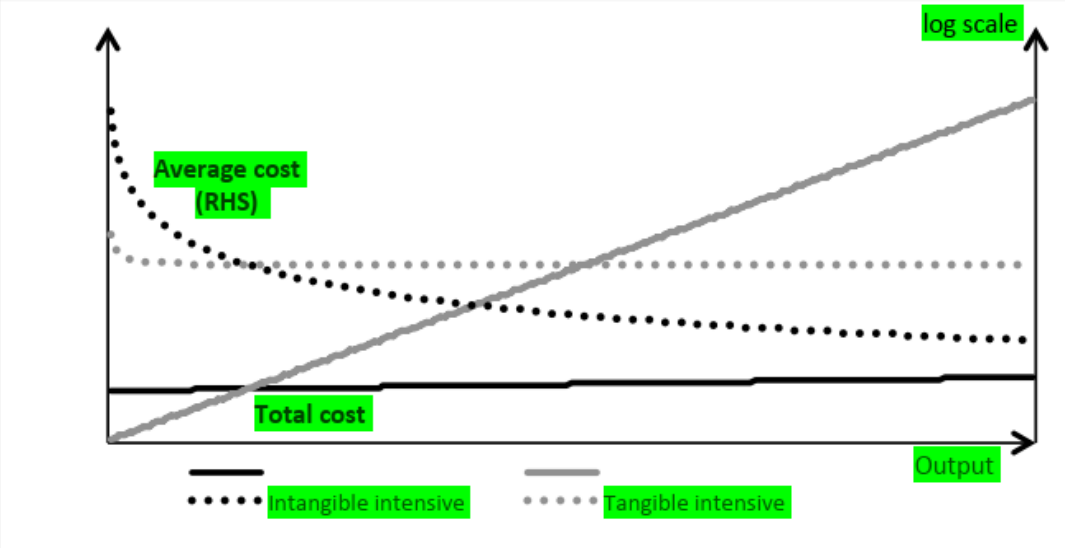
Furthermore, giant internet companies like Google, Facebook, Apple, Amazon, Tencent, and Alibaba rely on the accumulation and the centralization of user-generated data and information that results from GVC integration process. "This accumulation of data from suppliers and customers becomes proprietary data and represents a core asset that can create significant competitive advantage" (Durand C. & Milberg W., 2018, p.26-27), allowing these internet platforms to enhance user experience and to provide targeted advertisements to other businesses. This business model has contributed to their explosive growth and made them among the world's biggest corporations in terms of market capitalization. Their ability to generate, control, and manage data has enabled them to accelerate to scale.

These lead firms have also an advantage in gathering data from implementing trans-organization information systems, especially in the field of manufacturing and production process. "There is […] a vertical competitive struggle for the control of data. On the one hand, letting data circulate is a pre-condition for allowing the integration and the optimization of business processes along GVCs. On the other hand, such integration gives disproportionate data access to those who initiate and organize the chain integration. The asymmetric design of information systems and the uneven bargaining power in contractual negotiations allow dominant firms to learn from their partners' businesses processes. Because the control of data […] gives companies the ability to innovate and cut out their competitors upstream or downstream, the uneven distribution of data along GVCs entails a dynamic and cumulative advantage for firms that plays a lead role in chain integration" (Durand C. & Milberg W., 2018, p.27-29).

As a conclusion, the uneven distribution of returns to scale mechanism is related to the distinction in nature between tangible and intangible assets. Intangible assets such as

standards, specifications, R&D, software, and organizational know-how offer infinite returns to scale since they have negligible marginal costs after the initial investment. This feature is in contrast with tangible assets: although tangible assets may have increasing returns, their physical nature makes them subject to diseconomies of scale at some point. Along GVCs, certain segments are intensive in tangible assets, such as manufacturing, assembling, and transportation. Conversely, other segments are intensive in intangible assets, such as design, marketing, and supply chain management. As GVC output increases, the segments that rely more on intangible assets, such as design and marketing, expand at a faster rate than those that rely more on tangible assets, such as manufacturing and transportation. This leads to total costs growing more rapidly for tangible-intensive segments, while average costs diminish more rapidly for the intangible-intensive segments. As a result, firms that control the intangible-intensive parts of the chain receive a disproportionate share of the gains from the network. This uneven distribution of returns to scale, due to uneven distribution of intangible intensity in the various nodes of a chain, contributes to the centralization of network externalities (Durand C. & Milberg W., 2018, p.29-30).

Figure 1.22 Total and average cost dynamics for tangible intensive and intangible intensive segments



Source: Durand C. & Milberg W., 2018, p.30

Summing up, "intellectual monopoly in Global Value Chains results from two distinctive but partially overlapping and cumulative processes. The first one, examined earlier, arises from the complementarity between the fragmentation of production and stricter intellectual property rights. The second […] results from the role of intangibles within the

GVC form of industrial organization: firms playing a leading role in the integration benefit from natural monopoly forces arising from the complementarities between the participants to the chain, from the collection of data generated by the activities along the chains, and from the uneven distribution of returns to scale between tangible intensive and intangible intensive nodes. These forces are not exclusive from one another and generate rents[15] that can be combined" (Durand C. & Milberg W., 2018, p.30-31).

1.2.4. Intellectual monopoly, benefits and risks

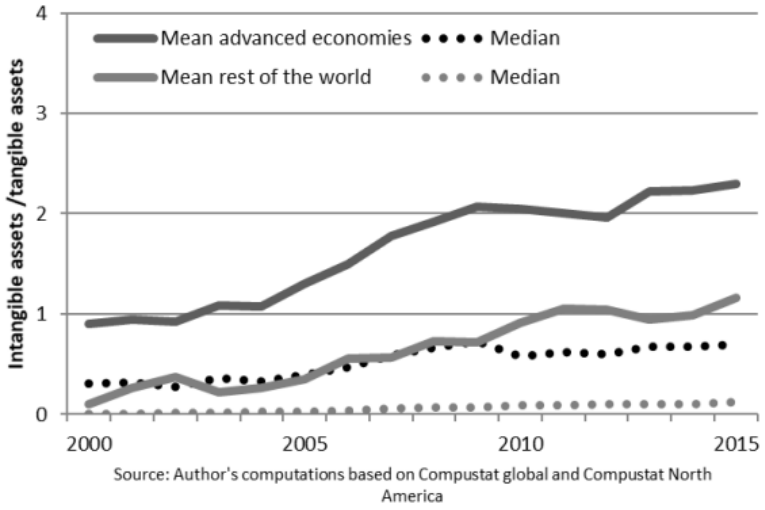
Companies and countries that are able to generate and exploit innovation and increase their skills as a result of their participation in the GVC system have the opportunity to improve their position within the system itself by generating industrial upgrading. In the current economic landscape, industrial upgrading has emerged as a vital driver of economic development. China's impressive industrialization progress is widely attributed to its active participation in GVCs, while other nations (Vietnam) have also sought to leverage GVCs' reduced entry barriers and market access for economic development. However, as GVCs continue to shift towards intangible-intensive domains, there are concerns regarding the impact of intellectual monopoly on economic growth and development. Three key issues arise: first, the uneven geographical distribution of intangibles, which are heavily concentrated in industrialized countries, may impede developing countries' economic and social upgrading. Second, monopolization dynamics may exacerbate trends in high-income economies that reflect financialization and reduce capital investment. Lastly, the control over intangibles to capture value can lead to a decline in national tax bases, an issue that affects developing and high-income economies alike (Fariselli P., 2020; Durand C. & Milberg W., 2018).

In particular, the uneven allocation of intangible assets in GVCs can lead to lead firms capturing an outsized portion of benefits as previously mentioned. Nevertheless, the scenario in China is unique due to its significant domestic market size and robust political centralization, enabling it to avoid enforcing intellectual property (IP) protection for some time and to benefit from some knowledge spillover in GVCs in order to bolster domestic economic development. However, most developing countries are not able to emulate China's

[15] Durand and Milberg (2018, p.31) label legal monopoly rents, natural monopoly rents, dynamic innovation rents and intangibles-differential rent.

approach (Durand C. & Milberg W., 2018).

Figure 1.23 Relative intangible asset intensity in advanced and developing countries (2000-2015)



Source: Durand C. & Milberg W., 2018, p.33

Moreover, in GVCs intellectual monopolization can create stagnation dynamics through two main channels. The first involves the scarcity of investment opportunities resulting from Intellectual Property Rights (IPRs), while the second stems from endogenous monopoly dynamics generated by intangibles' circulation in GVCs. The dominant position of lead firms in GVCs leads to less competitive pressure, reducing their investment incentives. In that sense, monopolistic tendencies have long been associated with a decline in economic growth and reduced social welfare (*Ibidem*).

As a conclusion, the absence of harmonization in tax systems across countries creates avenues for exploiting tax regimes through transfer pricing and other practices in the context of Global Value Chain (GVC) trade. Intangible assets, which are not tied to a particular location, enable lead firms to fully exploit particular countries' fiscal advantages and may even foster Global Inequality Chains (for more information see Durand C. & Milberg W., 2018, p.35).

1.3. Digital platforms, GVCs and international trade

The creation of the digital economy and the development of Global Value Chains (GVCs) have been two major changes affecting international trade since the 1990s, both of

which are connected to new information and communication technology (ICT). These changes have led to an increase in trade inclusivity, benefiting micro, small, and medium-sized enterprises (MSMEs), individuals, and developing countries. The emergence of the digital economy has opened up new business opportunities, such as facilitating exchanges, offering new marketing, finance, and networking opportunities, and reducing information search costs. These developments have diminished the barriers that once restricted MSMEs and individuals from engaging in cross-border trade. Previously, firms had to attain a significant size to be able to afford resources required for exporting, but the advent of digitization has significantly lowered the minimum scale required to conduct international business (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; World Trade Organization, 2019; McKinsey & Company, 2016).

Digital economy has also brought new business structures that enable MSMEs and startups to expand their reach beyond their borders. This has resulted in the rise of micro multinationals and born global firms, which have the potential to increase MSMEs international trade and participation[16] in Global Value Chains. In addition, digital platforms generate network effects that enable MSMEs to gain access to a larger consumer base, leading to an increase in their productivity[17] and promoting economic development (*Ibidem*).

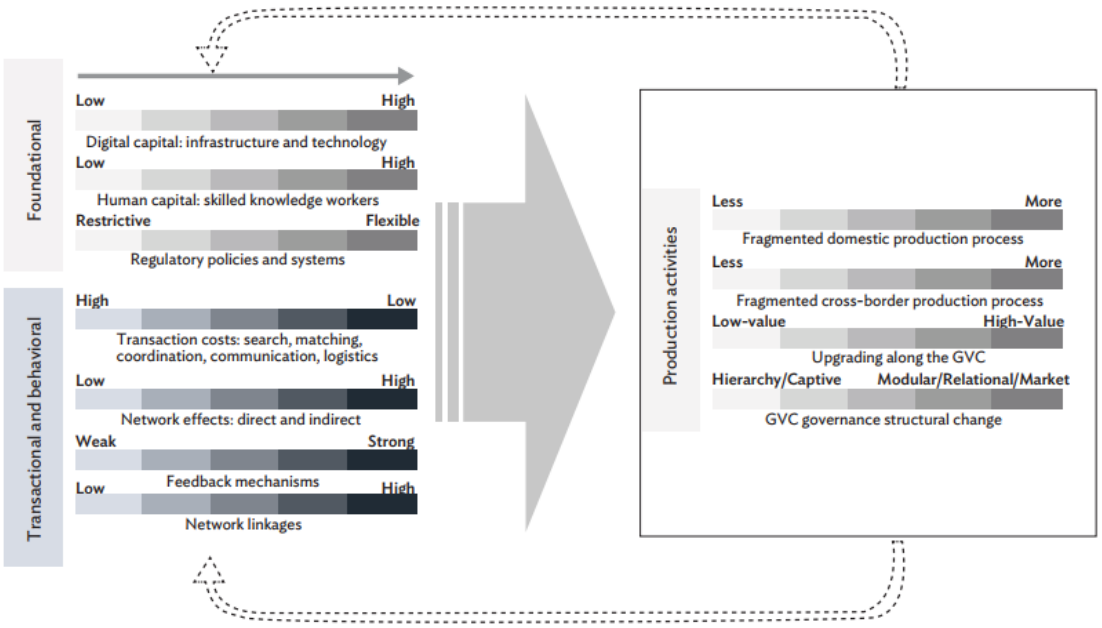
Moreover, digital platforms are playing an increasingly important role in international trade and Global Value Chain (GVC) systems, particularly in facilitating cross-border transactions on e-commerce marketplaces[18]. As a result, digital platforms are reshaping economies[19].

To enable firms, particularly MSMEs, to participate in GVCs using digital platforms, two readiness factors need to be present. The first, foundational readiness, requires an economy to have physical infrastructure for Internet access, human capital or know-how among the population, and national regulations that enable e-commerce transactions. The second, transactional and behavioral readiness, pertains to the digital platforms themselves and their ability to facilitate market transactions by reducing search and coordination costs,

[16] Digital platforms can enhance economic inclusivity by reducing market entry barriers through their services, such as online advertising, market research, and e-payment (*Ibidem*).
[17] Productivity improvements arise from the reduction of information asymmetries by means of ratings and review systems, as well as increased competition between service providers, resulting in cheaper and better sourcing options for companies (*Ibidem*).
[18] E-commerce has created fresh opportunities for businesses of all sizes to access worldwide markets, including purchasing and vending intermediate or end products (*Ibidem*).
[19] Micro, small, and medium-sized enterprises (MSMEs) have been able to benefit from the growth of e-commerce in both domestic and international markets, especially in areas of competitive advantage such as specialized manufacturing and services (*Ibidem*).

leveraging network effects, and using effective feedback mechanisms to enhance transactions. Once both factors are in place, GVC participation will depend on the level of modularization in value chains, with more fragmentation creating more opportunities for external parties, such as MSMEs and developing country to participate. This inclusivity [20] of Digital Globalization has important implications for businesses and economies, especially in developing countries. Research shows that digital technology can have a positive impact on the participation of MSMEs in backward-linked GVCs and on the total exports of MSMEs. This is because these small companies are more likely to use foreign inputs for production and export their output. Digital platforms offer an opportunity for MSMEs to overcome local market constraints and access global customers, suppliers, financing, and talent (*Ibidem*).

Figure 1.24 Mechanisms through Which Digital Platform Economies Enable Firms to Engage in Global Value Chains



Source: ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.192

"The extent of this openness and participation depends on GVC governance structures[21]" (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.189) (for more information

[20] From a development perspective, the global digital inclusion of businesses of any size is significant because MSMEs comprise over 90% of firms globally and account for more than 60% of global employment (*Ibidem*).

[21] "Gereffi, Humphrey, and Sturgeon (2005) categorize value-chain governance—that is, who participates in a chain and what their role is—into five main groups, which are important in the consideration of digital platforms. The first group are market value chains, or market linkages, where two parties interact with each other regularly, but without formal contracts. As a result, switching from one supplier to another is easily done. The second group includes modular value chains where buyers request custom inputs from a seller. It is, however, possible to make these inputs on standard machinery available to other providers and therefore suppliers have only limited market power. The third group includes relational value chains that are highly integrated. Here, two

see Gereffi, Humphrey, and Sturgeon, 2005). In particular, "when it comes to e-commerce marketplaces and certain other types of GVC trade facilitated by digital platforms, the governance structure" (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.191-192-193) tends to have a less hierarchical or captive structure, favoring a modular and market-oriented approach instead. This approach has several implications for MSMEs and developing countries. Firstly, the modular architecture of digital platforms can foster innovation within firms and GVCs, allowing technologically constrained players to enter less demanding parts of the value chain. Secondly, developed digital platforms enable participants to avoid investing their own resources in creating something similar from scratch. Finally, platforms can reduce coordination costs between different players by using standard software that is easily transferable.

In developing countries, these benefits for MSMEs are dependent on the type of governance structure present (platform-driven) and on the extent to which that governance requires firms' cooperation within the GVC system. Relational GVCs involve close connections between firms and the intra-firm trade of intangible goods, which can lead to upgrading through learning and innovation. However, e-commerce marketplaces tend to have modular or market-based governance structures, which means that some trade facilitated by digital platforms will fall into the broader definition of trade in intermediate inputs without the additional exchange of intangible value-added that accompanies relational GVC trade. This is important for MSMEs and businesses in developing countries to consider when deciding whether to participate in these types of trade (*Ibidem*).

"In other words, if firms are only producing finished products, information exchange between industries is scant and the exchange of intangible value is decreased. Since high competition on low costs and large volume of modular inputs and information asymmetries in buyer driven GVCs (such as those facilitated by e-commerce marketplaces) where owners don't want to share their proprietary information with developing countries and MSME partners, mutual learning is found to be limited" (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.193).

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parties may be dependent on one another, and the relationship can be long lasting.
The fourth group contains captive value chains in which smaller suppliers depend on larger buyers. They face significant hurdles or costs to switch, however. The fifth group is hierarchical, with vertically integrated GVCs and top-down management from headquarters to subsidiaries. Each of these five governance structures holds both opportunities and barriers for more inclusion. Modular value chains, for example, open opportunities for MSMEs to enter GVCs, but upgrading or differentiating a product can be challenging for these firms, and the value added from modular value chains can be low because of asymmetries and the bargaining power of lead firms" (Antràs 2019 in ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.190).

This led to the idea that digital platforms could partially replace traditional Global Value Chains due to their ability to exchange information and use verification technologies, which could reduce the need for formal Global Value Chains relationships. In that sense, digital technologies have created a new governance structure for Global Value Chains called internet-driven Global Value Chains. These chains incorporate digital platforms as intermediaries between suppliers and customers. This development has caused physical stores and retailers to lose their significance, a trend further accelerated by the COVID-19 pandemic. Additionally, internet-driven Global Value Chains have introduced a two-sided market where customers can provide feedback directly to suppliers or manufacturers, influencing product development and output. Internet-based virtual intermediaries, on the other hand, have given rise to new types of value chains, such as the data-driven value chain that involves generating, processing, and selling data products (*Ibidem*).

Digital or hybrid Global Value Chains offer numerous prospects for integrating MSMEs into the global economy, especially given their modular structure. However, policymakers need to consider the heightened risks[22] associated with these chains in order to provide adequate support to MSMEs and developing countries in this new digital economy era (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; World Trade Organization, 2019; McKinsey & Company, 2016).

To summarize, digital platforms and the new digital economy are intrinsically linked to Global Value Chains. These developments offer MSMEs and firms from developing countries the chance to participate in Global Value Chains and global economy. E-commerce marketplaces can decrease fixed transaction costs, including finding products or customers, handling payments, and reducing information asymmetries. Nevertheless, despite the potential for digital platforms to make Global Value Chain participation more accessible, inadequate infrastructure and limited digital capabilities continue to exclude many individuals. Therefore, it is crucial to provide access to ICT infrastructure and improve education to involve all participants in the digital platform economy (*Ibidem*).

[22] Cyberattacks, supply chain disruptions, digital platforms' natural monopoly and gatekeeping situation preventing innovation and competition, lock in, price discrimination (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; World Trade Organization, 2019; McKinsey & Company, 2016).

1.4. Measuring the volume and the economic value of data

The digital revolution has led to the emergence of new business models that rely heavily on data. Data plays a critical role in the production processes of goods and services and is increasingly viewed as a valuable asset by businesses, which use it to gain business insights, optimize processes, improve products and services, and conduct research and development. While there are various indicators to measure the volume of cross-border data flows, there is limited economic research and no agreement among economists regarding the most effective method to categorize various types of data and its economic value for business operations and productivity. Therefore, it can be said that, although data has become ubiquitous, its economic value is frequently uncertain, which makes it hard to measure at the company, industry, and country levels. The aim of this section is to try to investigate the volume and the economic value of data from a business perspective (Nguyen, D. and M. Paczos, 2020; Casalini, F. and J. López González, 2019; Mitchell J., D. Ker and M. Lesher, 2021; Frontier Economics, 2021).

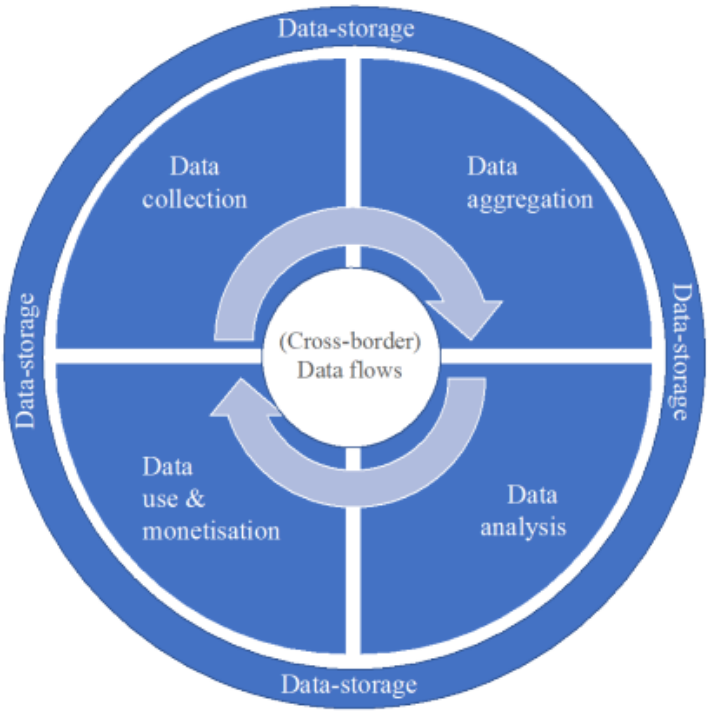
1.4.1. Data value cycle

For many years, companies have been involved in collecting, aggregating, and analyzing data to improve their business operations. This includes using data to coordinate supply chains, make better decisions, and introduce new goods and services. However, this incremental digitalization does not fundamentally change the core business models of these companies. These types of companies are referred to as data-enhanced businesses, which use data to create new value within an established business model (data-driven innovation). In contrast to data-enhanced businesses, there are companies that can be classified as fully digital, or data-native/data-enabled businesses[23]. For these companies, data is the foundation of their operations and the main driver of their revenue-generating activities (Nguyen, D. and M. Paczos, 2020; Casalini, F. and J. López González, 2019; Mitchell J., D. Ker and M. Lesher, 2021; Frontier Economics, 2021). In both data-enabled and data-enhanced businesses, the value derived from data is typically a result of data analytics and the data itself. The

[23] They include online platforms that rely on data and analytics to connect users with providers of goods or services (Amazon, Uber, Twitter, Booking.com, and Airbnb) (*Ibidem*).

methods by which firms capitalize on the data-analytics relationship depend on the business model they adopt.

Figure 1.25 The Global Data Value Cycle



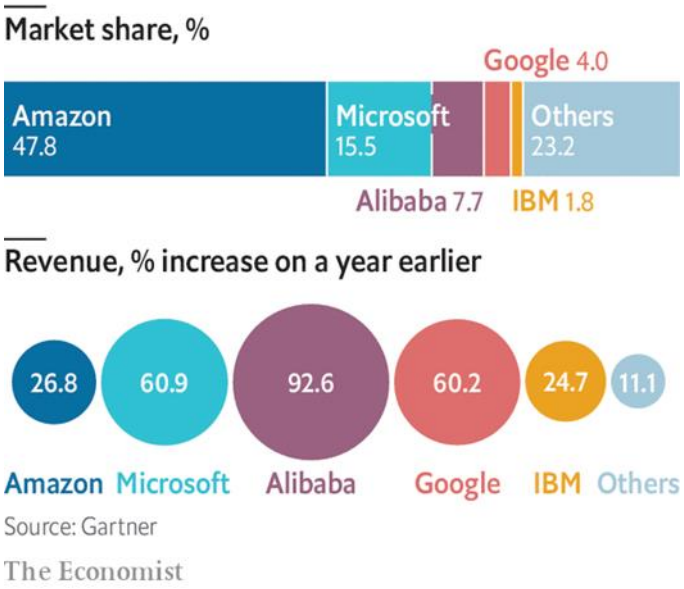
Source: Nguyen, D. and M. Paczos, 2020, p.13

According to Nguyen and Paczos (2020), there are four stages involved in generating value from data: 1) collecting data, 2) aggregating data, 3) analyzing data, and 4) using and monetizing data. All of these stages rely on data storage and cross-border data flows which occur throughout. The first stage involves collecting raw data from one or multiple locations, including different countries. The second stage, which involves the aggregation of data, can be a challenge for businesses due to barriers to data transfers, particularly for cross-border transactions. The third stage is data analysis, which can take place in another location and involve additional data transfers. Lastly, the monetization stage generates further data that can feed into the data value chain, creating a global data value cycle. In this process of collecting, aggregating, analyzing, and monetizing data, businesses can achieve and benefit from economies of scale by centralizing their data storage and computing in one or a few locations (centralization). However, some companies may prefer to store copies of their data in data centers located in different parts of the world (decentralization) to safeguard against disasters and reduce access times (latency). Cloud [24] (centralization) and edge computing

[24] "Cloud computing is a huge, highly scalable deployment of compute and storage resources at one of several

(decentralization) are technologies that enable this process.

Figure 1.26 Cloud services, worldwide (2018)



Source: The Economist, 20/02/20

1.4.2. Data types and characteristics

In Nguyen and Paczos (2020), a comprehensive classification of data is presented, which distinguishes economic and social aspects (i.e., personal vs. non-personal, open vs. closed) from the technical dimensions (i.e., users', machine-generated data). This taxonomy is primarily used in the context of big data, which refers to the volume of data. However, it is important to note again that there is no single classification system that covers all types of data.

distributed global locations (regions). In practice, cloud computing is an alternative – or sometimes a complement -- to traditional data centers. The cloud can get centralized computing much closer to a data source, but not at the network edge. Edge computing is the deployment of computing and storage resources at the location where data is produced. This ideally puts compute and storage at the same point as the data source at the network edge"
(https://www.techtarget.com/searchdatacenter/definition/edge-computing, accessed on 07/03/23).

Figure 1.27 Overview of different data types

Key aspect	Data Type	Description
Funding of data collection and maintenance	*Private sector data*	Data that is funded, created, maintained and held by the private sector, e.g. car company in-house generated data on their production processes, or a database of purchases from an online grocery shop.
	Public sector data	Data that is funded, created, maintained and held by the public sector; Example: data on health records of patients or individual tax records, or data originating from the US GPS satellites[23].
Ownership or right to use	*Proprietary data*	Data with clearly defined ownership that is protected by Intellectual Property Rights or any other rights with a similar effect (OECD, 2019a); this could include *individual* data as well as *organisational* data [24].
	Open data (or public domain data)	Data that is publicly available (as opposed to proprietary data), free to use by anyone for any purpose without any legal restrictions. It is not protected by Intellectual Property Rights, copyrights or any other similar legal rights; Example: *data.gov.uk*, which is a repository maintained by the UK Government to make non-personal UK government data available to the public.
Data subject	*Personal data*	Personal data is any data that allows for the identification of an individual data subject (OECD, 2013b). It can cover public and private sector data, e.g. user-generated content (e.g. blogs, photos, tweets) or geo-location data from mobiles as well as public sector data (e.g. police records, social security numbers).
	Organisational data	Organisational data describes data that allows for the identification of organisations. This data is usually controlled by organisations themselves, either legally or for contractual reasons. It can also be held by public bodies such as tax authorities. It is often commercially sensitive data.
Data generation	*User created data*	User created data is data that has been made available by an individual (e.g. telemetry tracking data, consumer behaviour data collected through mobile apps or social media posts). This can be volunteered data (i.e. "active"), observed data (i.e. "passive" or "implicit"), or derived data about a user (see also OECD, 2019c).
	Machine generated data	Machine generated data, e.g. machine-to-machine communication (M2M); Internet of Things (IoT), i.e. data collected from sensors.
Data source	*Internal data*	Internal data is data that collected and consolidated from different branches within a business. For example, lists of purchase orders from the sales department, transactions from accounting or any other internal source which is responsible for recording information about a business' commercial interactions.
	External data	External data is data not collected internally, but rather obtained from a source outside of company - for instance, by purchasing access to a proprietary database. This could be *acquired* data as well.

Source: Nguyen, D. and M. Paczos, 2020, p.21-22-23

For instance, the Swedish National Board of Trade (2015) has developed a classification system for data types based on their usage. The system includes six categories: corporate data, end-customer data (B2C), human resources data, merchant data (B2B), technical data, and personal data.

The U.S. Department of Commerce (2016) has classified four types of data flows:

purely non-commercial data traffic, which includes government and military communications; transaction data flows between buyers and sellers at a market price, which includes online banking or advertising; commercial data and services exchanged between or within businesses or other related parties at zero market price, which includes design information; digital data and services delivered to and from end-users at zero market price, which includes free email, free maps and navigation, and social media.

Data possess unique characteristics that make them a valuable intangible asset within various business models. Data has non-rivalrous nature, can be utilized multiple times without losing its value and can be exploited and reused countless times at low marginal cost. The cost of reusing data is mostly determined by data infrastructure and analytics (Nguyen, D. and M. Paczos, 2020; Casalini, F. and J. López González, 2019; Mitchell J., D. Ker and M. Lesher, 2021; Frontier Economics, 2021). Additionally, data can be a source of monetization and value creation if they possess certain characteristics, including: linkability, accessibility, disaggregation, timeliness, trustworthiness, representativeness, and scarcity.

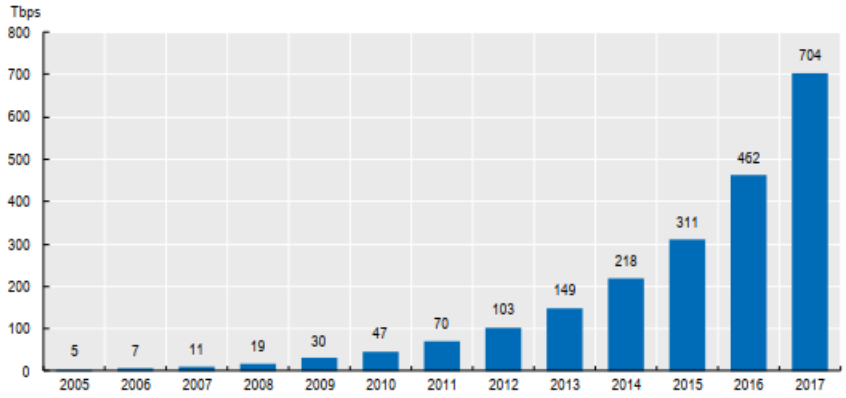
"There are also some data characteristics that are often discussed in the context of big data and its features – known as the 3 V's of big data: volume, variety, velocity. For example, data volume, understood as data being a collection of a sufficient number of observations (closely related to the statistical power of data), could impact the data's value-generating potential. However, as noted above, volume alone will not be a sufficient characteristic that determines economic value. When considering the costs of storing and processing large amounts of data (though those have decreased drastically in recent years), hoarding large a volume of irrelevant data could even be detrimental to business performance" (Nguyen, D. and M. Paczos, 2020, p.21).

1.4.3. Cross border data flow and volume measurement

The ability to transfer data across borders has become increasingly important for businesses to maintain and develop complex Global Value Chains, allowing them to efficiently coordinate research and development, supply chains, production, sales, and post-sales processes, thus creating economic value (Nguyen, D. and M. Paczos, 2020; Casalini, F. and J. López González, 2019; Mitchell J., D. Ker and M. Lesher, 2021; Frontier Economics, 2021). In 2017, in terms of volume, global cross-border data flows exceeded 700 terabytes per

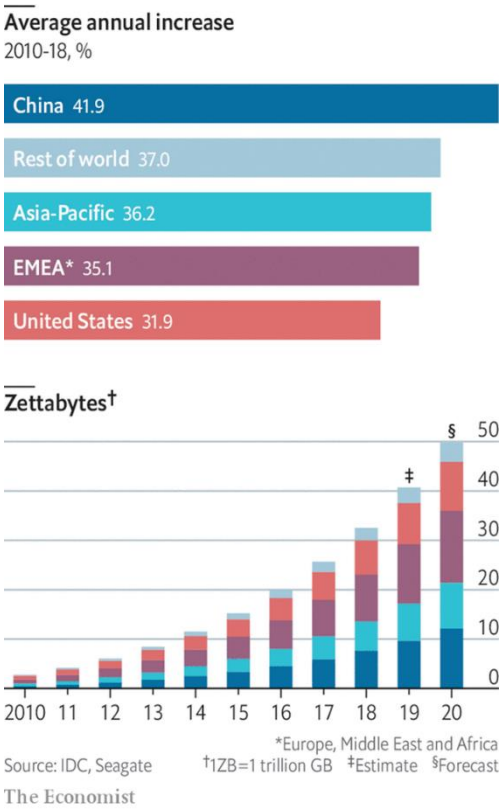
second (Tbps), representing a 64-fold increase since 2007, according to McKinsey Global Institute (2019).

Figure 1.28 Total used cross-border bandwidth (2005-2017) (Terabytes per second)



Source: Nguyen, D. and M. Paczos, 2020, p.25

Figure 1.29 Data generated worldwide (2010-2018)



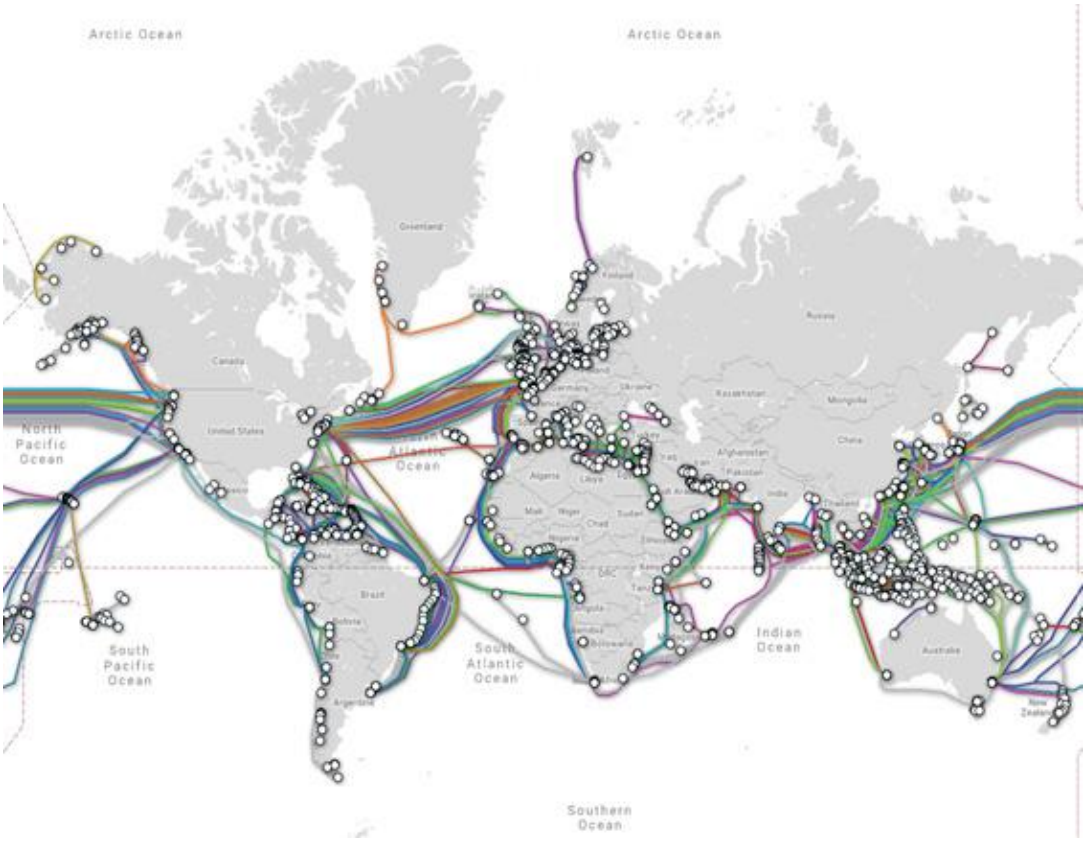
Source: The Economist, 20/02/20

Data transfers across borders[25] are similar to those generated within countries or

[25] Cross-border data flows occur between businesses (B2B), within businesses, between businesses and consumers (B2C), and between machines (M2M) (Nguyen, D. and M. Paczos, 2020).

regions (Figure 1.29), although latency[26] rates can be higher for cross-border transfers, impacting the accessibility, timeliness, frequency, and reliability of data and thus data value. Numerous online platforms such as Uber, Airbnb, and eBay provide their services globally by relying on cross-border data flows. They collect consumer behavior and transaction data from different locations which need to be transferred across borders for storage, aggregation, and analysis. These insights are then used to deliver commercial services like targeted advertising, demand forecasting, and price elasticities of consumers in multiple locations. At an inter-continental level, most of the data is transferred through submarine cables, which can be used as an indicator of the volume of cross-border data flows. The installed capacity of submarine cables can provide insight into which markets are more connected in terms of data connectivity (Nguyen, D. and M. Paczos, 2020; Casalini, F. and J. López González, 2019; Mitchell J., D. Ker and M. Lesher, 2021; Frontier Economics, 2021).

Figure 1.30 Global Submarine Cable Map (2018)



Source: Nguyen, D. and M. Paczos, 2020, p.27

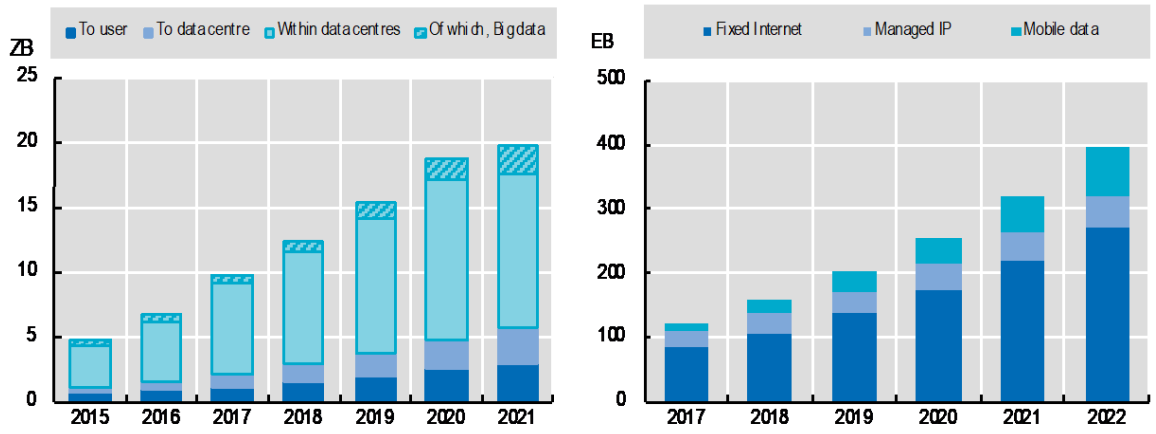
Figure 1.30 confirms what was shown earlier in this chapter, i.e., some parts of the

[26] Latency can also increase the costs of data analytics if data need to be stored in multiple locations (Nguyen, D. and M. Paczos, 2020).

world are more connected than others. As expected, the routes between the East Coast of the US and Europe, and the West Coast of the US to East Asia have high capacity for submarine cables. Additionally, South-East Asia is also experiencing a significant and growing capacity for such cables (*Ibidem*).

Another indicator of the scale of global data infrastructure and volume of cross-border data flows is data centers, which allow for data storage and remote computing through the Internet (cloud and edge computing). Such centers comprise servers that can be used solely by a company (private cloud or colocation services), rented from cloud service providers (public cloud), or something in between (hybrid cloud) (*Ibidem*). In that sense, the usage of international bandwidth is now dominated by content providers, such as Amazon, Google, Facebook, Microsoft. Their share of international bandwidth usage has risen to 54% in 2018, which is similar to traditional internet backbone providers. To meet the increasing demand for their services, content providers have become significant contributors to the development of global data infrastructure by constructing submarine cables and data centers.

Figure 1.31 Global data center traffic[27], by type and Consumer Internet Protocol (IP) traffic, by sub-segment (2015-22)



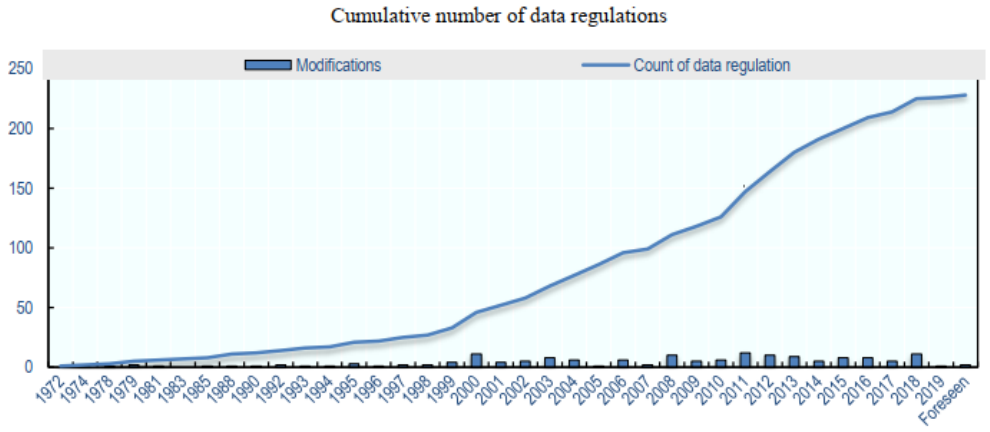
Source: Nguyen, D. and M. Paczos, 2020, p.30

As a conclusion, the number of data regulations, the share of global e-commerce revenue (from selected sectors), the share of total value added in selected countries/regions (PRC, EU, USA) and the service value added embodied in manufacturing exports can serve as

[27] "Zettabytes per year (left-hand panel) and Exabytes per month (right-hand panel). To data center refers to traffic flowing from one data center to another, for example, moving data between clouds, or copying content to multiple data centers as part of a content distribution network. To user refers to traffic that flows from the data center to end users through, for example, streaming video to a mobile device or PC. Within data centers refers to traffic that remains within a data center, for example, moving data from a development environment to a production environment within a data center, or writing data to a storage array" (Nguyen, D. and M. Paczos, 2020, p.30).

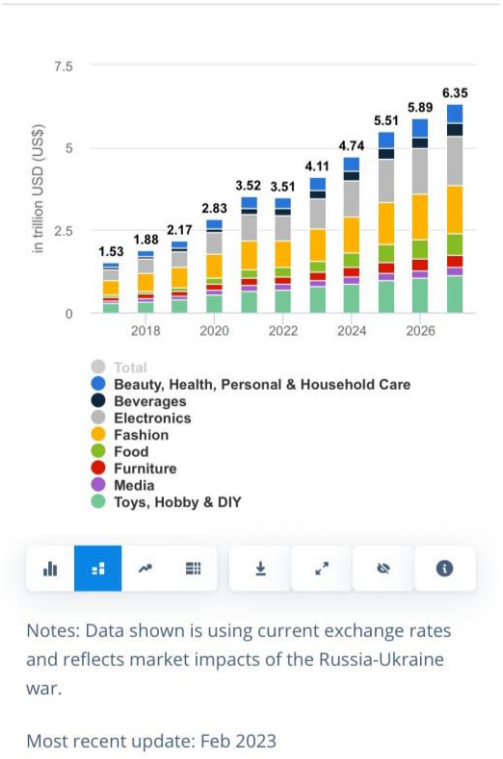
useful indicators for measuring the volume of data flows (also cross-border). Alongside these measurements, a deeper look into the increasing capacity of internet infrastructures, the increasing content hosted on the Internet and the ICT investment and expenditure in ICT intermediate services can also serve as useful indicators for measuring the volume of data flows (also cross-border), as eloquently shown by the following figures.

Figure 1.32 A growing number of data regulations (1972 - Foreseen)



Source: Casalini, F. and J. López González, 2019, p.15

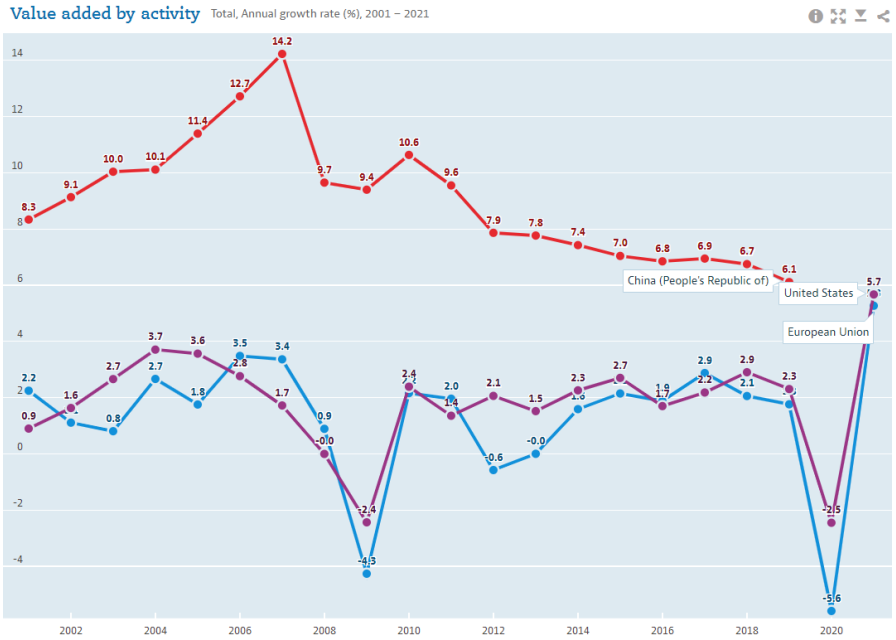
Figure 1.33 The share of global e-commerce revenue (from selected sectors) (February 2023)



Source: Statista, https://www.statista.com/outlook/dmo/ecommerce/worldwide#revenue,

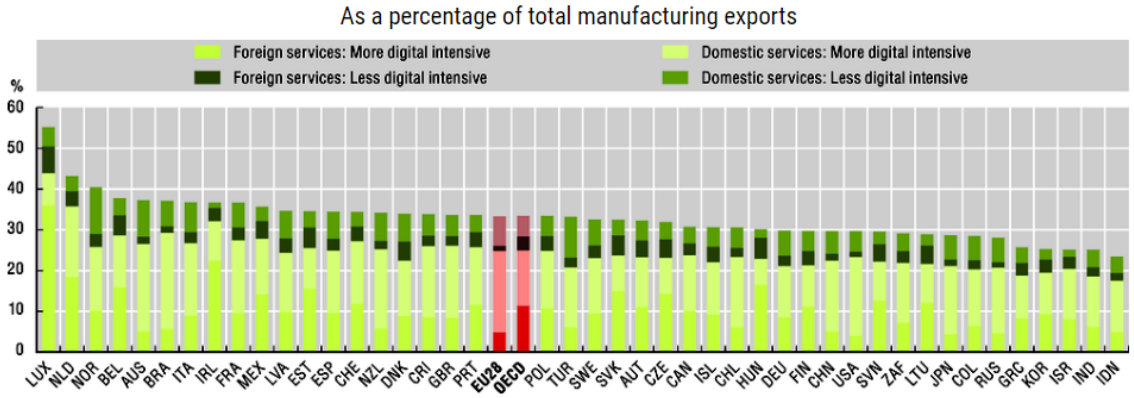
accessed on 11/03/23

Figure 1.34 The share of total value added[28] in selected countries/regions (PRC, EU, USA) (2001-2021)



Source: OECD, [2023], Value added by activity (indicator). doi: 10.1787/a8b2bd2b-en (Accessed on 11 March 2023)

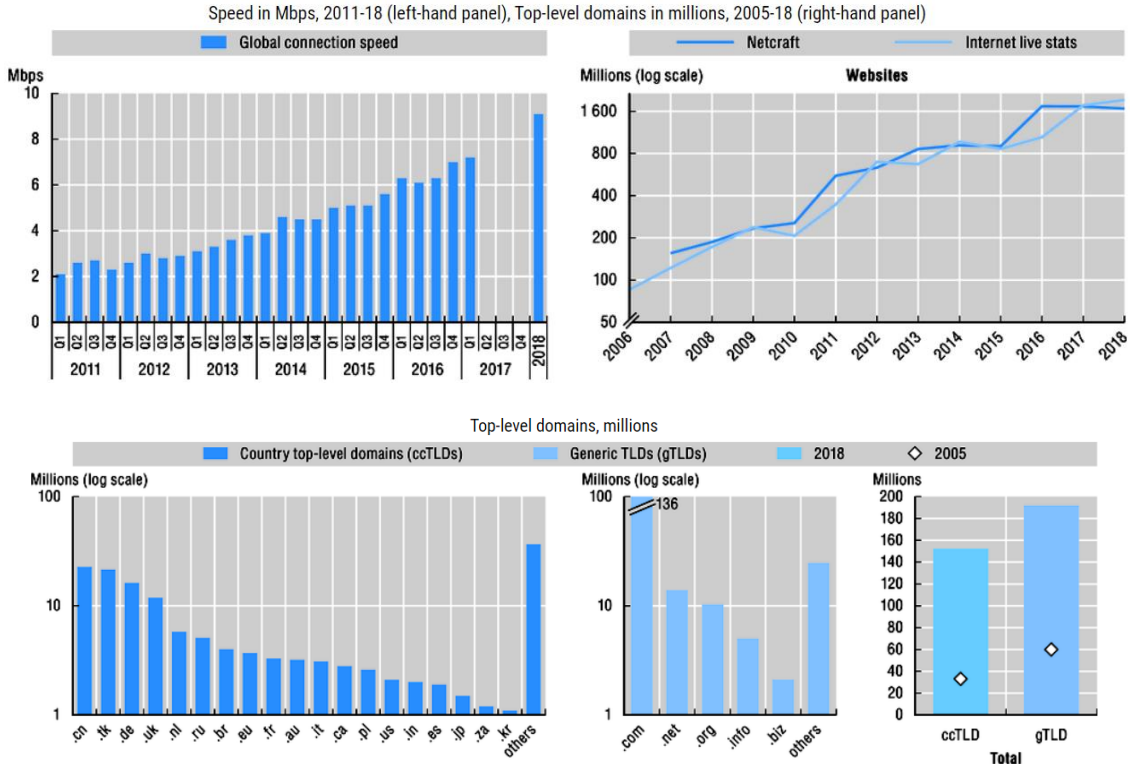
Figure 1.35 Service value added in manufacturing exports, by origin and digital intensity (2015)



Source: OECD, 2019

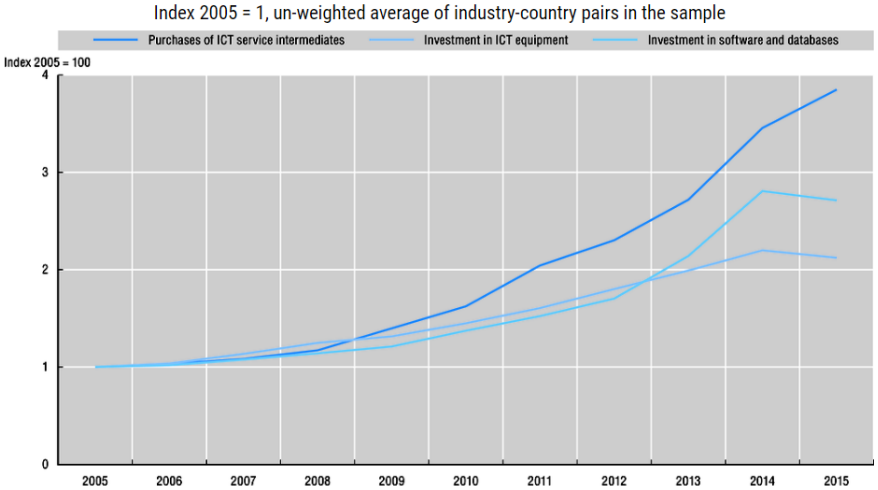
[28] "Value added reflects the value generated by producing goods and services and is measured as the value of output minus the value of intermediate consumption. Value added also represents the income available for the contributions of labour and capital to the production process. Value added by activity shows the value added created by the various industries (such as agriculture, industry, utilities, and other service activities). The indicator presents value added for an activity, as a percentage of total value added. All OECD countries compile their data according to the 2008 System of National Accounts (SNA)" OECD, [2023], Value added by activity (indicator). doi: 10.1787/a8b2bd2b-en (Accessed on 11 March 2023).

Figure 1.36 The increasing capacity of Internet infrastructures and the increasing content hosted on the Internet (2005-2018)



Source: OECD, 2019

Figure 1.37 ICT investment and expenditure in ICT intermediate services (2005-2015)



Note: Intensities are calculated by dividing investment and expenditure by the industry-country (deflated) value added. Year-on-year growth rates in industry-country values are averaged over 33 OECD countries and industries, while accounting for the unbalanced nature of the sample. As intensities are calculated as flows of investment or intermediate consumption divided by the industry's value added, the reported growth rates are not driven by the growth of production in the industries themselves. As all values are separately deflated, growth rates do not reflect price changes in the period either.

Source: OECD, 2019

1.4.4. Economic value measurement from a business perspective

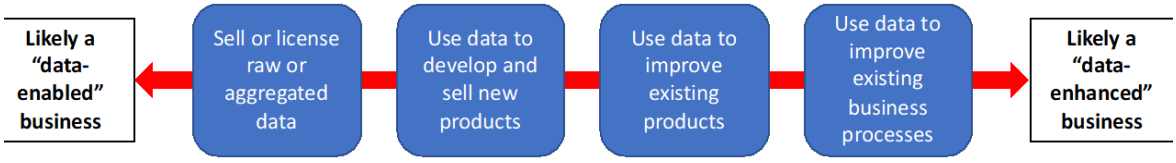
There is currently no standardized method for measuring the value of data from a business perspective, but experts agree that simple measures of data volume are insufficient. Measuring data in terms of bits and bytes does not capture the information that each unit contains. Instead, understanding the context of data usage and categorizing data types and characteristics are essential for measuring its economic value. Economic value is determined by a combination of factors, including the data's information content, demand for the data, and its intended use (monetization) (Nguyen, D. and M. Paczos, 2020; Casalini, F. and J. López González, 2019; Mitchell J., D. Ker and M. Lesher, 2021; Frontier Economics, 2021).

As previously mentioned, there are various ways in which data can be monetized, such as selling data, using data to improve operations, developing new products and services, and improving existing ones. These different monetization methods are closely tied to specific business models. To better understand the role of data in different business models, a taxonomy developed by Nguyen and Paczos, (2020) is presented. This taxonomy considers how data is used to generate revenue, either currently or in the future (actual or intended use) and applies to different business models and to businesses that combine multiple business models.

This taxonomy focuses on how businesses generate economic value by describing the different ways in which companies generate and capture economic value, i.e., create or improve revenue streams. The adopted business model is a key factor that answers essential questions about which products or services to offer to which customers, how to deliver economic value, and at what price.

"Hence, the business model seems an appropriate starting point when thinking about how businesses rely on data – directly or indirectly – in order to create value, develop a competitive edge and, ultimately, to generate streams of revenue. Certainly, a company can adopt multiple models at the same time" (Nguyen, D. and M. Paczos, 2020, p.16).

Figure1.38 The use of data: data-enabled vs. data-enhanced business models

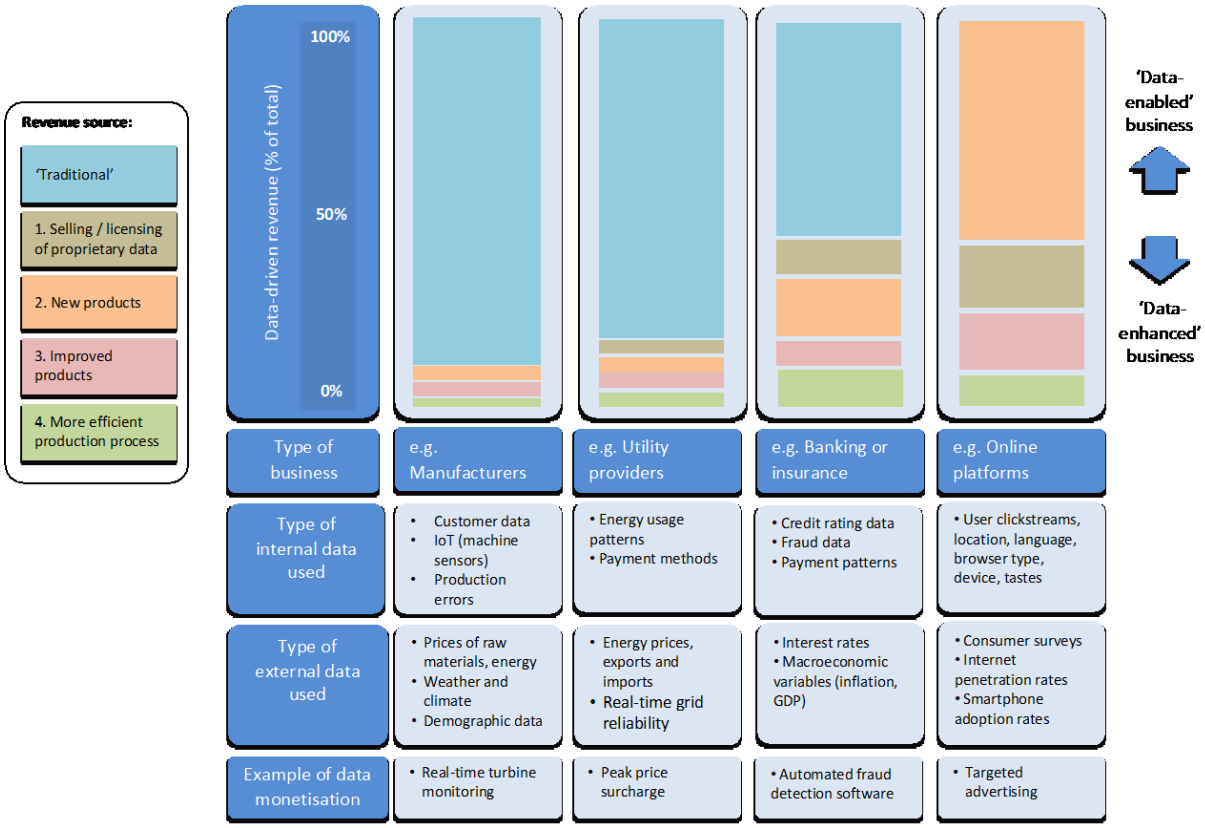


Source: Nguyen, D. and M. Paczos, 2020, p.16

The Figure 1.38 illustrates "how data could be used in different business models within a company. Four categories of data-related business models are distinguished, and it is illustrated how they relate to the distinction between data-enhanced or data-enabled businesses:

- Category 1. Selling or licensing raw or aggregated data.
- Category 2. Developing and selling new data-related products.
- Category 3. Use data to improve existing products.
- Category 4. Use data to improve production processes or business efficiency" (Nguyen, D. and M. Paczos, 2020, p.16).

Figure 1.39 Data monetization across business models and sectors



Source: Nguyen, D. and M. Paczos, 2020, p.17

Figure 1.39 **"**provides a schematic illustration of this taxonomy that relates stylized business types to the four different data-related business models outlined in Figure 1.38 based on the use of internal and external data. The key metric proposed to measure the economic value of data for a business is the share of total revenue that is derived from the monetization of data (in some form or another). For the distinction of data-enabled and data-enhanced businesses, the categorization refers to their core business model, defined here as the main source of revenue generation" (Nguyen, D. and M. Paczos, 2020, p.16).

The colored bars in Figure 1.39 represent the potential contribution of various revenue streams to a business's overall revenue. The taxonomy categorizes revenue streams as either data-driven or traditional (non-data-driven). A business is classified as data-enabled (as opposed to a data-enhanced business) if data-driven revenue exceeds half of total revenue (dashed line). The taxonomy also illustrates the types of internal and external data that businesses can use for monetization purposes. The purpose of this representation is to classify businesses based on how they generate economic value from data. By utilizing internal or external sources of data, or a combination of both, businesses can create new ways to generate economic value for themselves and their customers (Nguyen, D. and M. Paczos, 2020, p.17).

A closer examination of data-enabled businesses' monetization strategy reveals that without the ability to collect or rely on external data and data analytics in order to improve their services or license data access, they would only be able to offer a small portion of their goods or services. Therefore, their revenue streams are entirely data dependent. In particular, according to Nguyen and Paczos (2020), there are differences in the degree to which businesses rely on specific models to generate revenue, as shown in column 4 of Figure 1.39. Amazon Marketplace, for example, relies heavily on a data-enabled service - a buyer-seller matching platform (category 2) - to generate revenue. However, Amazon also uses data in other ways, such as allowing sellers to promote products to specific individuals (category 3) and licensing internally collected customer behavior data (category 1). Additionally, Amazon continually uses data to improve its algorithms (category 4) and uses a data-driven approach to offer its own products that compete with independent sellers on its platform.

Looking at the near future, Nguyen and Paczos (2020) predict that the development of artificial intelligence (AI) will bring forth new business models and result in further transformations for firms. Many data-enhanced businesses (car manufacturers), for instance, will undergo significant changes in their core business models, shifting from traditional goods such as vehicle sales to digital services like offering mobility solutions through on-demand or

subscription-based vehicle rentals over the Internet.

As a conclusion, this section tries to answer to the following question: "What is the purpose of measuring the value of data? In 1987 Robert Solow famously stated that - *You can see the computer age everywhere but in the productivity statistics* (Solow, July 1987) – those words could be paraphrased today in the context of the seeing data everywhere but in business balance sheets. It is clear that a better understanding of how data contributes to adding value and raising productivity […] is inevitable. But, […] this requires consistent and reliable statistics that are able to capture the complexity of data uses in the modern economy. The development of methods for measuring the value of data is not an easy task and much more research on the topic is vital" (Nguyen, D. and M. Paczos, 2020, p.37).

1.5. Policies, strategies and competition

The cross-border exchange of data has generated concern among governments and citizens about the potential negative consequences of collecting, transferring, and using so much information (personal data). Some countries have expressed concern related to privacy and national security and have called for more extensive regulation of the Internet and data flows. This has significant implications for the international trade regime. While data was supposed to move freely across borders, governments are increasingly blocking data flows to safeguard their people, sovereignty, and economy. This digital protectionism could lead to "AI nationalism" which involves not just defending data assets, but also building a data economy. Thus, governments are updating data-related regulations and conditioning data transfers across borders or imposing data localization[29].

As a result, the absence of a clear focal institution has led to a fragmented internet governance regime. Consequently, there is a significant divergence in the national governance of the Internet, exemplified by policies such as data localization, internet filtering, and privacy-driven controls. These policies are closely linked to economic objectives aimed at controlling trade flows or promoting domestic digital sectors and catch-up strategies. Although barriers to cross-border data flows may be justified on grounds of national security, data privacy, or protecting domestic markets, it is evident that such impediments to

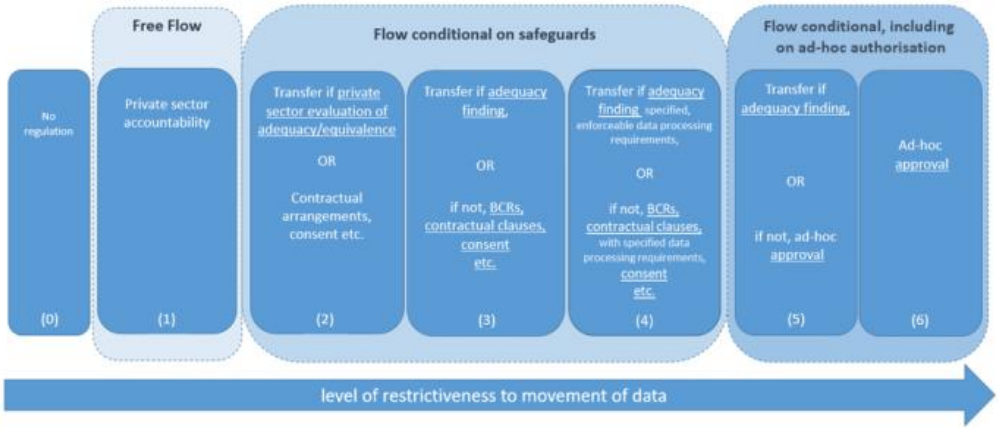
[29] The Economist, [20/02/20], The data economy. A deluge of data is giving rise to a new economy; https://www.cigionline.org/articles/global-governance-of-data-and-digital-technologies-a-framework-for-peaceful-cooperation/, accessed on 07/03 /23.

international data transfers can have adverse economic effects on businesses, value chains, and trade (Azmeh, Shamel et al., 2019; *Ibidem*).

1.5.4. Approaches

According to Casalini, F. and J. López González (2019), four broad approaches are emerging for regulating cross-border data flows. The first approach involves the absence of cross-border data flow regulation, typically in least developed countries where there is no data protection legislation. This approach does not restrict the movement of data, but the lack of regulation may deter others from sending data. The second approach does not prohibit cross-border data transfers nor require any specific conditions, but it holds data exporters accountable if data sent abroad is misused. The third type of approach regulates data flow by allowing transfers only to countries that have been deemed adequate (EU GDPR[30]) in their privacy protection standards by a public or private sector entity. In addition, private sector safeguards, such as contractual mechanisms, may also be required. The last approach permits data transfer on a case-by-case basis and is subject to discretionary approval by relevant authorities, referring not only to personal data but also to a broader category of data called important data, including national security data. Local storage requirements, or the requirement that data be stored locally (PRC CSL[31]), are closely related to data flow restrictions but are often more sector-specific and may not come with flow or processing restrictions. To conclude, the most restrictive approaches combine local storage with processing and flow requirements.

Figure 1.40 Indicative taxonomy of approaches to cross-border data flows



Source: Casalini, F. and J. López González, (2019), p. 17

[30] The European Union's General Data Protection Regulation.
[31] The People's Republic of China Cyber Security Law.

Table 1.1 Types of barriers to cross-border data flows

• Local storage and local processing regulations (i.e. the requirement to keep and/or process data on servers located within a given country).
• Data protection regulation (i.e. laws governing the collection, use and transfer of personal data. The most comprehensive example is GDPR in the European Union, which has been in force since May 2018).
• Competition and antitrust law adapted to digital markets (i.e. a set of economic policies that are designed to favour the exporting conditions faced by digital, data-enabled enterprises of a particular nationality, e.g. EU Parliament voting for the legal breaking up of Google operations in the EU).
• Cybersecurity (i.e. a collection of technologies, processes and controls designed to protect systems, networks and data from an unauthorised exploitation, e.g. EU working towards the introduction of a certification process for IoT devices to increase their cybersecurity).
• Intellectual property rights (e.g. on digital content such as music, movies and books).
• Restrictions on Internet use, censorship and blocks against data transfers.

Source: Nguyen, D. and M. Paczos, (2020), p.28

Azmeh, Shamel et al. (2019) highlight two examples of data flow restriction policies depicted in Table 1.1, i.e., internet filtering and data localization. The Great Firewall of China is a prime example of internet filtering, allowing the government to control information flow and censor content. It also acts as a trade barrier by limiting foreign goods and services' access to Chinese businesses and consumers and supporting the growth of domestic digital firms. Data localization policies are another tool used to regulate trade flows and access to foreign digital products. These policies require data (or a category of data) generated within a state to be stored domestically, which can increase costs for global firms and promote the growth of domestic digital ecosystems. Data localization can also function as a protectionist trade policy, as the cost of establishing data infrastructure for storage and processing can be prohibitively high, especially in data-intensive sectors. Therefore, data localization can be employed as part of a broader policy to promote domestic digital industries by forcing investments from transnational firms or supporting domestic firms.

1.5.2. Strategies and call for data cooperative governance

The widespread use of digital technologies and data has dramatically changed people's lives, but it has also highlighted significant issues related to internet governance [32].

[32] In 2011, the World Summit on the Information Society (WSIS) defined internet governance as "the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the Internet." (https://www.cigionline.org/articles/global-governance-of-data-and-digital-technologies-a-

Specifically, the rapid flow of data, especially personal data, has exposed governance gaps, and current governance arrangements for digital technologies and data are fragmented and inconsistent on a national and global level. This fragmentation is due in part to competing corporate, national, and geostrategic interests, particularly in the competition among China, the European Union, and the United States for technological dominance and control over the digital economy. This competition includes efforts to capture economic rents from digital technologies and to influence the setting of standards that shape how these technologies are used[33].

The expansion of digital trade and the absence of a cohesive approach to internet governance have resulted in a significant and expanding divergence in national policies. The policy directions pursued by China and the EU are examined in detail by Azmeh, Shamel et al. (2019). In the past 20 years, China has employed an interventionist approach to developing its digital economy through measures such as internet filtering, data localization, technology transfer, and joint venture requirements. The goal was to create a robust domestic digital sector using localized technologies at all levels, enforced by the Great Firewall of China which restricts access to the Chinese market. This approach has facilitated the rapid rise of Chinese digital giants like Baidu, Alibaba, and Tencent (BAT), while foreign companies have encountered strict market access conditions, causing some to withdraw from China, such as Uber and eBay, or be blocked entirely, like Google and Twitter. In the development of the Chinese digital sector, the state has been actively involved in supporting specific trusted firms and sectors, particularly in politically sensitive areas. This has led to a relatively small number of dominant digital firms in the Chinese market. As these firms have grown and become tech giants, policymakers are now collaborating with them to create strategies for technological development and global expansion. As the digital sector has expanded across the economy, the state's involvement is becoming more formalized into policy, rather than being an informal exchange between government and executives of dominant firms.

As China continues to grow economically, the success of its digital firms is becoming more closely tied to China's aspirations for the future. The government aims to promote indigenous innovation and encourage these firms to engage in high-value activities within the global economy. Based on policy indications, it appears that the Chinese government sees the dominant digital firms, such as Baidu, Alibaba, and Tencent, as instrumental in achieving

framework-for-peaceful-cooperation/ , accessed on 07/03 /23)

[33] https://www.cigionline.org/articles/global-governance-of-data-and-digital-technologies-a-framework-for-peaceful-cooperation/ , accessed on 07/03 /23; Azmeh, Shamel et al., 2019.

future goals using digital technologies to transform the economy. These firms have expanded their reach into a wider range of sectors, including internet of things, cloud and edge computing, artificial intelligence, robotics, and autonomous vehicles (*Ibidem*).

In contrast to China's centralized politics, the European Union (EU) faces more challenges in developing a national digital economic sector, given its more complex political and economic landscape. The EU is composed of various actors but can be broadly categorized into two factions: a digitally liberal bloc, which includes the UK, Nordic states, and some Eastern and Southern European states, and a more digitally strategic bloc, mainly comprising Germany and France. This division is reflected in debates within different EU institutions. However, the EU has recently become more active in formulating policies to support the digital industry, with the Digital Single Market Agenda aiming at removing barriers to digital trade between EU member states. At the same time, the EU has been actively formulating policy to support the digital industry, particularly in relation to digital trade and data protection. Privacy issues are increasingly recognized as having important implications for digital trade, and the adoption of the General Data Protection Regulations (GDPR) is a notable example of this. The GDPR allows for free movement of European personal data to states the European Commission deems adequate and requires specific protocols for data transfers to other countries. This regulation gives the EU a strong tool to control European data flows, potentially weakening the market power of digital giants and enabling users to switch to new platforms. The GDPR is increasingly viewed by other countries as a model for national data protection legislation and serves as a soft driver for data localization, encouraging more data storage within the EU (*Ibidem*).

As a conclusion, the internet governance policies of China and the EU reflects their competition for technological dominance, which involves the use of regulations, legislation, and data sovereignty. Despite differences in values and geopolitical tensions, there is a growing consensus among scholars, institutions, and the digital industry itself that more harmonized global regulation is necessary. This has led to proposals for the creation of a Digital Stability Board (DSB), a multi-stakeholder forum that would establish global governance for big data, artificial intelligence, and digital platforms. The DSB would shape global standards, regulations, and policies across the platform economy; advise on best practices, as well as share insights about the regulatory and policy actions needed to address risks and vulnerabilities in a timely manner, while allowing for national variation to reflect

different values and cultures[34].

In order to achieve its objectives, the Digital Stability Board (DSB) would focus on:

- "Coordinate the development of international governance in standards, regulations, principles and policies across the big data value chain.
- Monitor the implementation of principles, standards and policies by jurisdictions and firms, in conjunction with other international organizations.
- Assess vulnerabilities and risks arising in the digital economy, and where international coordination is required.
- Innovate digital governance by taking the lessons learned and disseminating them.
- Ensure that this work feeds into other organizations and coordinate outreach to ensure full participation of developing countries and civil society" (*Ibidem*).

The DSB would be scalable, starting with a specific area and scaling to other areas to ensure coherence. Initially, the DSB could focus on coordinating standard setting for digital technologies along the data value chain[35].

[34] https://www.cigionline.org/articles/global-governance-of-data-and-digital-technologies-a-framework-for-peaceful-cooperation/ , accessed on 07/03/23.

[35] In order to ensure efficient functioning of the digital economy, it is necessary to establish standards that address various aspects of data. This includes defining control and ownership of data, portability, sharing, removal, tracking, encryption, access, use, quality, storage, security, and more. Additionally, specific issues related to algorithms such as ethical use, bias, tagging, explainability, interoperability, safety, and risk must be addressed. At the end of the data value chain, numerous specific areas require standards, such as transparency, content dissemination, competition, privacy, interoperability, and others (https://www.cigionline.org/articles/global-governance-of-data-and-digital-technologies-a-framework-for-peaceful-cooperation/ , accessed on 07/03 /23).

Chapter 2. China

"Globalization and digital disruption have reshaped the world trade order and industrial landscape - a process that has put China at the center" (Wang H. and Miao L., 2022, p.103). Since the US Congress approved US-China trade relations and China's accession to the World Trade Organization in May 2000, China's economic system has undergone significant changes. In particular, "the post-pandemic era is expected to hold great potential for China's development. The country is in the process of shifting its economic development model from one that emphasizes high volume growth, scale and across the-board development to one that prioritizes quality growth, efficiency and structural optimization. Such changes are boosting the likelihood that China will emerge as the world's largest economy in the coming decade" (Wang H. and Miao L., 2022, p.103). These changes led some scholars to conclude that China's economic system is no longer compatible with Western capitalist economies and to predict a potential US-China decoupling in the near future.

However, looking back at the last two decades of economic reform and opening, China's engagement with the global economy has evolved in response to internal and external factors. In particular, China's relationship with Globalization has always been characterized by a delicate balance between the benefits of participating in global trade and the risks of external shocks (US-China trade war, Covid-19 pandemic, geopolitical tensions and military conflicts). These tensions are reflected in China's current dual circulation strategy, which formalizes a long-standing hybrid developmental model[36], involving export-oriented growth in the coastal regions and state-led investment in inland areas.

In addition, it is worth noting that China holds the second largest digital economy in the world and has emerged as a leader in several digital technologies. Indeed, Chinese domestic tech businesses and digital platforms such as Huawei, Xiaomi, and Alibaba have established themselves as leaders in 5G technology, fiber-optic networks, cellular network equipment, smartphone markets, and e-commerce on a global scale. Moreover, the importance of data and digital services in China's economy is closely linked to its manufacturing sector and its central position in Global Value Chains. This provides opportunities for exporting

[36] Through this economic model China is looking to actively promote domestic and foreign demand, import and export demand, coordinate between attracting foreign capital and making foreign investments, while balancing international payments (*Ibidem*).

digital services as inputs in manufactured goods. Nonetheless, China maintains significant restrictions on foreign competition in the digital sector, with limitations on imports and a highly regulated internet governance system that mandates data localization and restricts online information access. These restrictions seem to be in contrast with China's efforts to shape the international environment[37] and promote the development of norms and rules related to data governance that align with its domestic approach.

Starting from the abovementioned premises, this second chapter is organized as follows. First, the process of China's integration into ICT GVC is thoroughly depicted. Moreover, a deeper analysis of the Chinese position as world factory restructuring over the last two decades is provided, which resulted in a coexistence of export-oriented industry and domestic market-oriented production networks throughout Eastern, Western and Central regions. Then, the study mainly focuses on China's role as a fundamental driver of technological upgrading for the South-East Asia region and on China's digital rise and its attempt to create a balanced data asset ecosystem that fully releases the value of data, essential resource of this new wave of Digital Globalization (Wang H. and Miao L., 2022; Fu X., Zhang J. & Wang L., 2020; PIIE, https://www.piie.com/events/xi-jinpings-economic-model-and-future-globalization, accessed on 29/04/23; https://www.brookings.edu/articles/chinas-digital-services-trade-and-data-governance-how-should-the-united-states-respond/, accessed on 29/04/23).

2.1. China in the ICT GVC system

The ICT Global Value Chain has evolved considerably in recent decades, with China's involvement becoming increasingly important. Although the most innovative aspects associated with the activities of this sector have developed predominantly within the domain of the large Western corporations, the center of gravity of much of the production and assembly phases has been significantly rooted in the Asian continent, with China playing a progressively decisive role. The growing and massive shift of manufacturing activities to Asia has raised strong interest among scholars and policymakers on the consequences of a radical change of dynamics within that system, i.e. the extent to which China will be able to climb the Global Value Chain of the ICT sector, overcoming the levels of subalternity associated with

[37] As a hub of its Digital Silk Road (DSR) and Belt and Road Initiative (BRI), China is actively promoting the development of smart cities and broadband connectivity standards in international standard-setting bodies (Brookings).

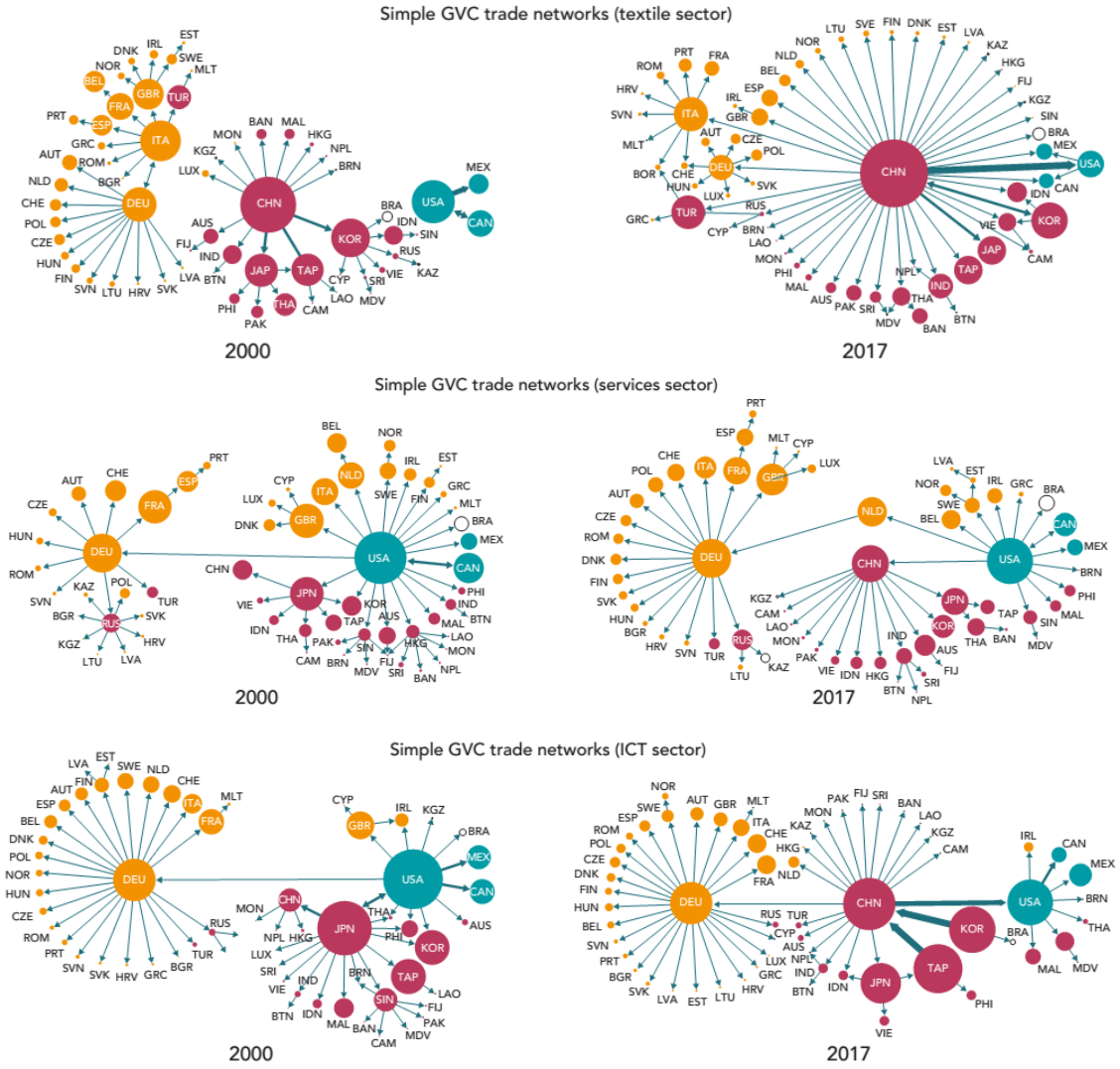
the supplier - assembler role typical of the flat part of the Smiling Curve (Sun and Grimes, 2016; Grimes and Yang, 2018; Baldwin and Lopez-Gonzalez, 2013). An analysis of the role assumed by China in its integration within the ICT GVC system is therefore necessary, as well as the factors that have led it, in its transition from world's factory to innovative economy, to occupy a prominent position in the global market.

Since the economic opening reform ("Open Door Policy") adopted by the Chinese state in the late 1970s, coastal regions located in the East of the country (Pearl River Delta) developed an export-oriented production structure (Yang and He, 2017, p. 574) that pivoted on Special Economic Zones - SEZs (Selden et al., 2013), implemented with the aim of attracting foreign capital (FDI) - mainly from Japan, the US and Europe - and increasing the export as a means of integrating China within the global economy ("strategic coupling[38]"). In its liberalization process, China has used different types of SEZs: Free Trade Zones, Export Processing Zones, Industrial Parks, High- Technology Parks. Initially located mainly near coastal areas, they have been progressively located throughout the country. To date, there are more than 500 national SEZs including 12 Free Trade Zones (the first of which opened in 2013 in Shanghai) (World Bank, DRC, 2019).

In two decades, therefore, China has undergone a profound transition from an economy predominantly based on heavy industry to one primarily based on attracting private foreign investment - FDI, Western transnational corporations, component suppliers as well as contract manufacturers, mainly in the ICT sector. This has led China to be, at the threshold of the new millennium, one of the most integrated and inclusive global manufacturing ecosystems (Fig.2.1) (Yang and He, 2017; Selden, Ngai, Chan, 2013; Grimes and Yang, 2018).

[38] An initial shift of production occurred in Asia to Taiwan by Japanese and Western companies in the 1960s-70s, even before China became the main destination of production relocation of these same foreign/Asian companies. This shift, in addition to a progressive integration of developing countries (China) within the GVC system is defined in terms of "strategic coupling", i.e. as "contingent convergence of interests as well as cooperation between two or more groups of actors [...] for a common strategic objective (regional development)" (Yeung, 2009 in Yang and He, 2017, p.572).

Figure 2.1 The supply centers of the Textiles, ICT, Services sectors (2000-2017[39])



Source: World Trade Organization, 2019, pp. 28-29-30

"China's outstanding performance in world markets over the nineties can be traced back to its increased involvement in the international segmentation of production processes, which has been deliberately encouraged by a selective trade policy granting preferential tariff treatment to assembling and processing activities[40]. The final stages of production in Asian matured economies have tended to migrate to China, enhancing its export capacities and the regional integration. China's strong specialization in the downstream segments of production is associated with large structural deficits in upstream segments (parts and components, semi-

[39] "The size of the circles represents the magnitude of value-added exports. The volume of value-added flow between each pair of trading partners is represented by the thickness of the line linking the two" (World Trade Organization, 2019, pp. 28-29-30).

[40] Tariff exemption for the importation of intermediate goods that are assembled and subsequently re-exported (processing trade).

finished goods) and this vertical specialization[41] has enabled China to rapidly diversify its exports of consumption goods and to build strengths in exports of equipment goods. This is most remarkable in the electrical machinery sector[42]. Moreover, the technology content of trade shows that parts and components have been a major channel for China's imports of high technology. The Chinese case thus fits the theoretical and empirical framework which puts forwards the gains that can be derived from vertical specialization and from trade in intermediate

goods. However, this strategy has led to a dichotomy between highly internationalized and competitive industries on the one hand and a more traditional exporting sector, based on domestic inputs, which is lagging behind, on the other hand." (Lemoine e Ünal-Kesenci, 2002, p.37)

Economic developments in recent years in China have shown a gradual transition from a predominantly investment-driven economy to a consumption-driven one. Since the financial crisis of 2007-08, when the share of GDP for final consumption was below 50%, and particularly since 2014, the share of GDP for final consumption has overtaken that for investment, becoming the main driver of growth, contributing for 57% to the country's entire economic growth. The consumption share progressively reached 53.6% in 2017 (World Bank and DRC, 2019, p.7).

2.2. Domestic and foreign market – GVC reconstruction and dual circulation

Following the financial crisis of 2007-08 and in parallel with a profound reorganization of the GVC system, the global economy experienced a relocation of export-oriented production enterprises from the coastal regions in the East of China to the inland provinces (decoupling and recoupling[43]) in order to further reduce production costs. This process of production reorganization was marked by the emergence of Chinese domestic market-oriented production structures on the one hand, and the power shift from Western lead

[41] "If comparative advantages can be found only in some stages of production, whereas others are disadvantaged, this is referred to as "vertical specialization" (Lemoine and Ünal-Kesenci, 2002, p.11).

[42] "In 1999 electrical machinery became the most important sector in processing trade, both on the export and import sides, overtaking textile and clothing" (*Ibid.*, pp. 15-16).

[43] The term decoupling takes the form of "a reduction or rupture [...] of a link established between a particular global production structure (GPN) and a territory, [...] resulting from a firm-based decision or initiative by territorial/state institutions" (Horner, 2014 in Yang and He, 2017, p.572). This process can lead to a phenomenon known as recoupling, which can be achieved with the same or another global production structure (*Ibid.*).

firms to Chinese strategic contractors (Foxconn) within the GVC system on the other (Yang and He, 2017).

Taking a quick look at the development of the domestic market, it can be seen that the 30-year success of the Chinese growth model has shown a number of vulnerabilities, generating a potentially negative trend (trade losses, weak private consumption, environmental damage) and prompting the Chinese economy to start shifting its center of gravity towards the domestic market (CEPII, 2010; Ma et al., 2017). Indeed, dualism in the export sector has limited the benefits of knowledge spillovers on technical progress and economic growth. Therefore, the strong export progress of Chinese and foreign firms has not automatically translated into a useful tool for promoting the economic growth of the whole country. Moreover, the increase in technological content in products exported from China has not been accompanied by a rise in their level. Despite its shift towards higher value- added stages of the Global Value Chain, China remains de facto specialized in the production and export of low-price goods in the textile-clothing sector and mass- produced standardized goods in the high-tech sector.

Parallel to a slight decline in exports (1997-2003), the price of imports of sophisticated inputs has risen sharply over time, as a result of the import of an increasing amount of intermediate goods for China's manufacturing industry. The dual movement (slight decline in exports and increase in input imports) altered Chinese trade. The country's GDP growth thus became increasingly dependent on foreign demand and the limited domestic consumption (due to weak wage growth and policies that failed to overcome dualism) became a weak link in China's economic growth.

Following the collapse of global demand (2008) and the collapse of exports and production in the Chinese economy, a vigorous domestic stimulus was needed to ensure a resumption of economic growth (which occurred from mid-2009). The shock from the negative consequences of the global financial crisis of 2007-08 prompted China to rebalance its economy by initiating a change in its development regime in order to stimulate domestic consumption and create a large domestic market (CEPII, 2010).

The central question is thus whether China will be able to achieve domestic rebalancing[44] in the coming decades by reducing investments and increasing consumption, while maintaining a stable economic growth, and also initiating a large-scale reorientation of

[44] China has an atypical domestic expenditure composition, characterized by one of the highest investment rates and lowest household consumption rates globally. However, some scholars (Ma et al., 2017) suggest that the consumption growth of the Chinese economy is not as weak as described and that any significant rebalancing is more likely to come from a decrease in investment than from an acceleration in consumption.

production and trade in order to mitigate the potential negative impact of Chinese rebalancing on its foreign trading partners (double rebalancing) (Ma et al., 2017).

A path of intra-regional relocation of production processes (decoupling and recoupling within the ICT sector) towards the Central and Western areas of China already started in the period 1998-2009, in parallel with an evolution of the export-oriented sector in the coastal regions where the Chinese world factory developed, leading China towards a profound transformation. Within this context of "glocal" dynamics, the relocation of the electronics industry since the 2000s can be seen as an interesting case study. Yang and He's (2017) analysis of the modalities and destinations of this relocation (decoupling and recoupling[45]) (Wuhan, Hubei; Zhengzhou, Henan; Chengdu, Sichuan), leads to a series of considerations.

First, the spatial evolution of electronics industry production and exports has shown a divergent pattern: while production has expanded inland, also by virtue of the emergence of production facilities oriented towards the domestic market, exports have remained primarily located in the coastal regions (East), which have remained more attractive mainly for logistical reasons. Ultimately, the implementation of very generous local policies to attract supplier flows of the electronics industry in the Central and Western regions of the country did not go in the direction of boosting Chinese exports, but rather in the direction of crossing the vast potential of the domestic market.

As Table 2.1 shows, between 1998 and 2007, the coastal (East) regions' share of production and export of the electronics industry increased (with a slight drop in 2009), confirming them as the most dynamic export-oriented regions.

At the same time, the share of electronics industry production and exports recorded by the Central and Western regions of China decreased (or remained almost unchanged). However, Yang and He's (2017) analysis shows that the strategy of spatial recoupling of production and exports has selectively affected a limited number of inland Chinese cities and provinces. In fact, some provinces (Hubei and Jiangxi in the center and Sichuan in the West) in Central-Western China have experienced a general upward trend in their electronics production and export shares (Table 2.2), acting as alternative locations for those leading companies or first-tier GVC electronics contractors interested in taking advantage of the foreign (export) market and the Chinese domestic market.

As regards the reorganization of the country's coastal regions (East), on the other hand,

[45] ''The recoupling of production relocation and export evolution is measured by the decline of the contribution of electronics sales values and exports as well as the ratio of the latter to the former in coastal regions, while it increased in inland regions'' (Yang and He, 2017, p.578).

they experienced a divergent evolution of production and exports in the electronics sector. In Guangdong Province (Pearl River Delta), the total national share of industrial output remained unchanged, while the national share of exports experienced a substantial decline (Table 2.2). In contrast, Jiangsu Province (Yangtze River Delta) experienced a substantial increase in both shares over time, coming to replace Guangdong as the leading export-oriented electronics manufacturing region in the country. The analysis thus shows (Fig. 2.2; Fig. 2.3) that a spatial evolution of production and exports of the electronics sector is taking place not only in the Central - West, but also within the coastal regions (East), with a tendency shifting from the Pearl River Delta to the Yangtze River Delta.

Table 2.1 Production and Exports (Electronics), China - geographical areas (1998-2009) (%)

Output	1998	2001	2005	2007	2008	2009
Eastern	96.9	97.2	98.6	98.6	97.9	97.6
Central	1.7	1.7	1.1	0.7	0.8	1.1
Western	1.3	1.1	0.2	0.7	1.2	1.3
Exports						
Eastern	98.8	99.5	99.4	99.4	99.0	98.7
Central	1.1	0.3	0.5	0.3	0.2	0.6
Western	0.1	0.2	0.1	0.2	0.7	0.8
Exports/Outputs						
Eastern	52.8	53.8	68.9	78.7	80.9	74.8
Central	33.5	9.3	31.1	33.5	20.0	40.3
Western	4.0	9.6	34.2	22.3	46.7	45.5

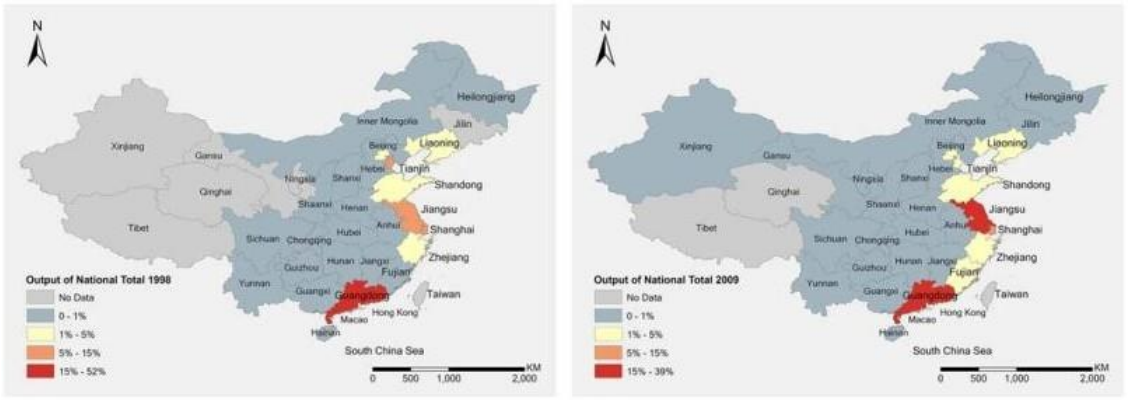
Source: Yang and He, 2017, p.578

Table 2.2 Ratio of Export/Output (Electronics), China - selected provinces (1998-2009) (%)

	Guangdong			Jiangsu			Hubei			Jiangxi			Sichuan		
	Output	Exports	Ratio of exports/ output	Output	Exports	Ratio of exports/ output	Output	Exports	Ratio of exports/ output	Output	Exports	Ratio of exports/ output	Output	Exports	Ratio of exports/ output
1998	34.6	51.2	54.9	11.6	13.1	42.0	1.2	0.1	3.8	0.4	0.1	10.4	4.5	0.3	2.3
2001	35.0	48.6	60.9	12.1	13.1	47.4	1.3	0.1	3.0	0.3	0.0	3.4	2.6	0.5	9.2
2005	36.3	37.1	63.0	19.6	22.1	69.4	0.8	0.3	20.4	0.2	0.1	30.0	1.0	0.3	16.1
2007	34.5	38.7	77.1	20.6	21.4	71.2	0.9	0.4	31.4	0.3	0.2	44.3	1.4	0.3	15.6
2008	36.6	39.5	76.5	19.5	23.3	84.8	1.1	0.4	26.8	0.4	0.2	28.2	1.6	0.5	24.3
2009	35.2	38.0	68.0	23.7	26.5	70.3	1.4	0.7	32.7	0.6	0.3	28.1	2.0	0.7	22.6

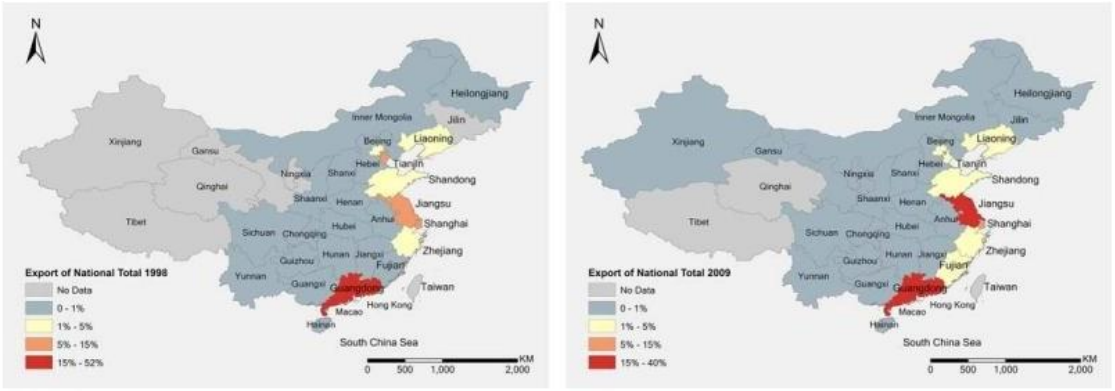
Source: Yang and He, 2017, p.580

Figure 2.2 Production (Electronics) in China by province (1998 -2009) (%)



Source: Yang and He, 2017, p.579

Figure 2.3 Export (Electronics) to China by province (1998 -2009) (%)



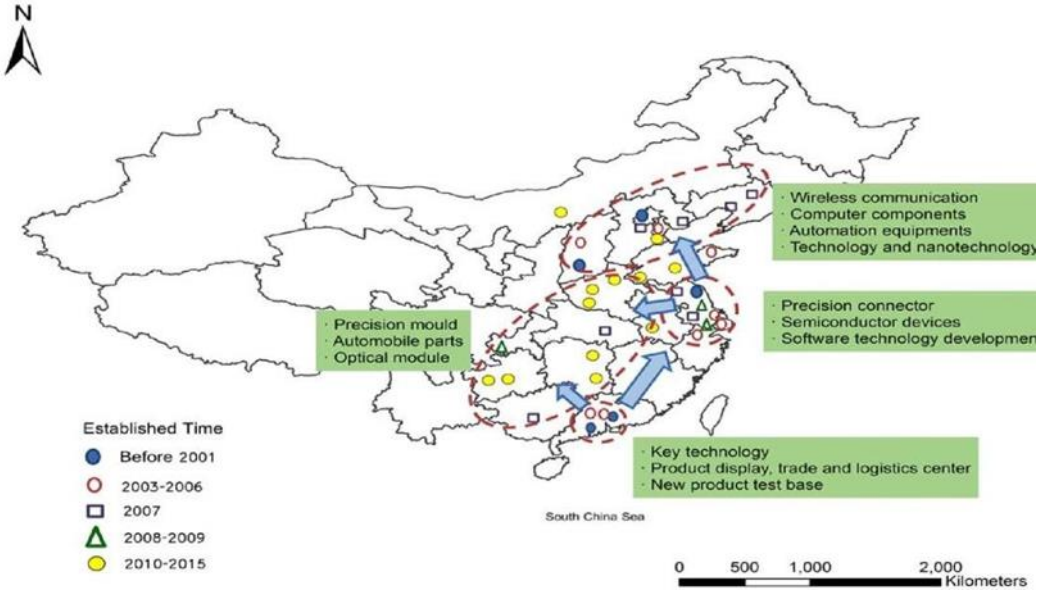
Source: Yang and He, 2017, p.579

The process of selective recoupling has been stimulated by preferential local policies that have induced a progressive and impressive spatial expansion in some Central-Western provinces (Fig. 2.4) of several Taiwanese ODM/EMS, including Foxconn, the largest producer of iPhones and iPads for Apple. Leveraging strong tax incentives and government

subsidies made it possible in 2012 to establish a Foxconn City within the Zhengzhou Technology Park (Zhengzhou, Henan)**.** Foxconn has been able to realize a profound inward expansion almost to zero cost, thus becoming a leading exporter of the Chinese economy (Yang and He, 2017; Selden, Ngai, Chan, 2013).

To conclude, following its integration into the ICT Global Value Chain system, the remarkable reorganization of the Chinese world factory over the past two decades expresses the coexistence of an export-oriented industry and domestic market-oriented production structures in the different Eastern, Western and Central regions of China.

Figure 2.4 Foxconn's spatial expansion in the Chinese hinterland



Source: Yang and He, 2017, p.582

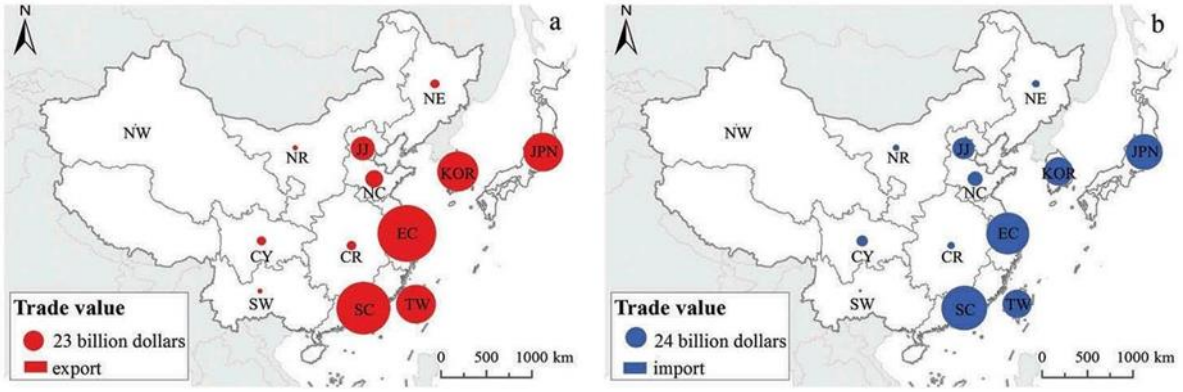
2.3. Regionalization in the South-East Asia region

China's rapid expansion in the ICT GVC system has led it to develop strong relationships with some of the surrounding countries such as Japan, Korea, Taiwan, and has also contributed to the economic growth and technological upgrading of the entire South-East Asian region (Gong, Liu, Tang, Yin, 2018).

Through a quantitative analysis of the inter-regional links among the production structures of the electronics industry (East-Asia), in order to identify the different roles assumed by the different countries and their potential interdependencies, Sturgeon and Kawakami (2010) make use of a number of indicators, such as spatial distribution of import -

export, analysis of backward and forward links[46] and composition of value added captured by different regions in the East - Asia group (Gong et al., 2018).

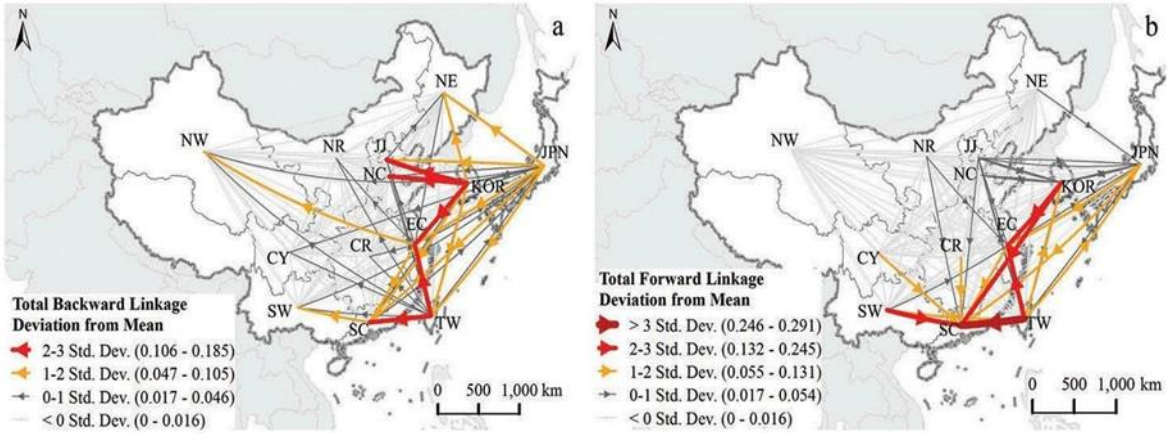
Figure 2.5 Spatial distribution of ICT exports (a) and imports (b), East - Asia (2010)



Source: Gong et al., 2018, p.85

First, the spatial distribution of import and export volumes (Fig. 2.5[47]) shows that the ICT sector trade takes place predominantly between China's coastal (South-East) regions and Japan, Korea, Taiwan, while the remaining eight inland regions of China register relatively low volumes. This reflects their limited participation in global ICT production, also supporting the thesis that the Yangtze River Delta and Pearl River Delta are the prime production locations for foreign transnational companies (*Ibid.*).

Figure 2.6 Backward (a) and Forward (b) linkages, ICT, East-Asia (2010)



Source: Gong et al., 2018, p.86

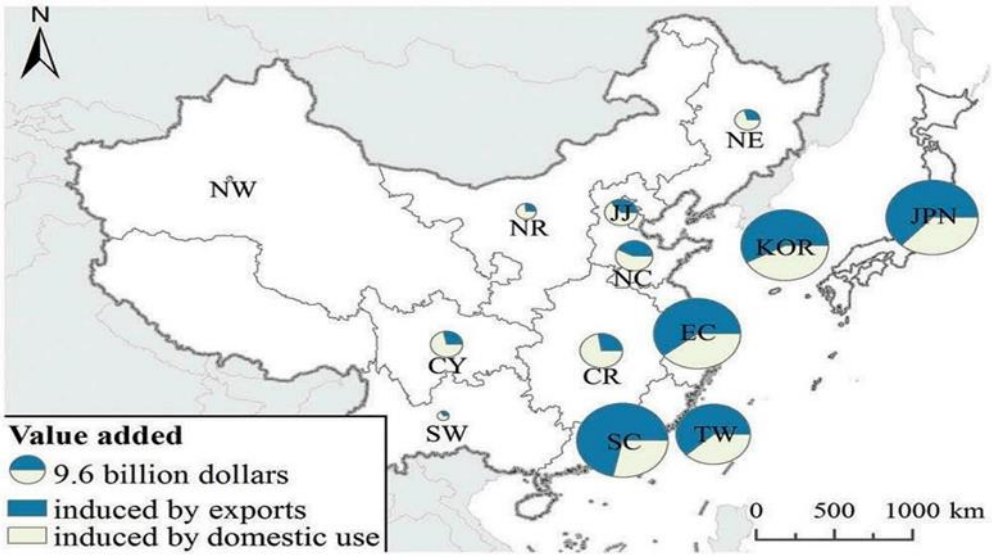
[46] Economies participate in GVCs by importing foreign inputs to produce goods and services for export (backward link), or they can export inputs produced within domestic borders (forward link), https://www.oecd.org/sti/ind/measuring-trade-in-value-added.htm, accessed on 29/04/23.

[47] In Figs. 2.5 and 2.6, the acronyms used correspond to the main players in the East Asian group (Japan, Korea, Taiwan) while the Chinese provinces are aggregated here into 10 regions (Northeastern region, Jing-Jin region, Northern coastal region, Eastern coastal region, Southern coastal region, Northern - Central region, Central region, Northwestern region, Chuan-Yu region, Southern Western region) (Gong et al., 2018).

Furthermore, it is clear from Fig. 2.6 that Japan, Korea, Taiwan and the coastal regions (South - East) of China are closely interconnected. In particular, these coastal regions (South-East China) hold strong backward linkages with Taiwan, Korea and Japan. This pattern, when put in relation to the abovementioned import-export structure, shows that the South-East regions of China are heavily dependent on Taiwan, Korea and Japan for the import of key components in final product assembly operations. Taiwan, on the other hand, holds strong backward as well as forward linkages with China (South- East), Korea and Japan, thus maintaining a crucial coordinating role within this Asian group as exporter of key components for assembly operations (*Ibid.*).

Moreover, the composition of the share of value added captured by each region operating in the ICT industry in East Asia (Fig. 2.7) shows that at the regional level, South-East China, Japan, Korea and Taiwan are profoundly dependent on the export sector for the creation of value added. The remaining regions in China's hinterland, on the other hand, rely primarily on domestic-oriented production structures, supporting the thesis that these economic actors are far from configuring themselves as global production centers (Gong et al., 2018; Yang and He, 2017).

Figure 2.7 The composition of ICT value added captured within East -Asia, 2010



Source: Gong et al., 2018, p.89

2.3.1. China as a driver for South-East Asia regional upgrade

The abovementioned analysis shows that Taiwan, Korea, Japan and China (South-East) are the main players operating within the ICT GVC production system, with China

(South-East) playing a decisive role in promoting the electronics industry development of the South-East Asia region (Gong et al., 2018, p.89). The analysis reported so far illustrates economic data dating back to 2010 and does not comprehensively document the crucial role China currently plays in the ICT sector within the South-East Asia region.

More recent studies, on the other hand (Torsekar and VerWey, 2019), make use of a number of indicators (gross trade statistics, measures of intra - regional trade, and FDI) and update previous findings. Indeed, Figs. 2.8 and 2.9 show the extent to which the East Asia Pacific (EAP[48]) group regions have played a dominant role[49] in the ICT GVC production segments over the past two decades (up to 2017), with China playing a leading role within that regional system (ICT RVC).

Indeed, China's growing role within the regional GVC system has been driven by a number of factors. First, during the period 2013 - 2018, China contributed for 44% to the region's total share of capital investment and for 32% to the region's higher value-added investments (FDI in software, information technology services, chemicals, communications, high value-added manufacturing). At the same time, over the past two decades (1996-2017), the composition of China's exports has diverged profoundly, with higher value- added exports (final goods) growing significantly more than lower value-added exports (intermediate goods). In addition to this total export growth (mix of imported and domestically produced intermediate goods) illustrated by Figure 2.10, some scholars (Torsekar, VerWey, 2019) suggest that the share of value added in China's exports increased from 55% to 67% during the same period.

[48] East Asia-Pacific. This refers to the Southeast Asia region that includes East Asia, South Asia, Southeast Asia and Oceania.

[49] "As total intra-regional trade within the electronics products sector has grown from a negligible level in 1996 to 40 percent of as of 2017, China has remained the principal driver of GVC trade" (Torsekar and VerWey, 2019, p.7).

Figure 2.8 Trade between East Asia Pacific and trading partners, Electronics (1996-2017) (%)[50]

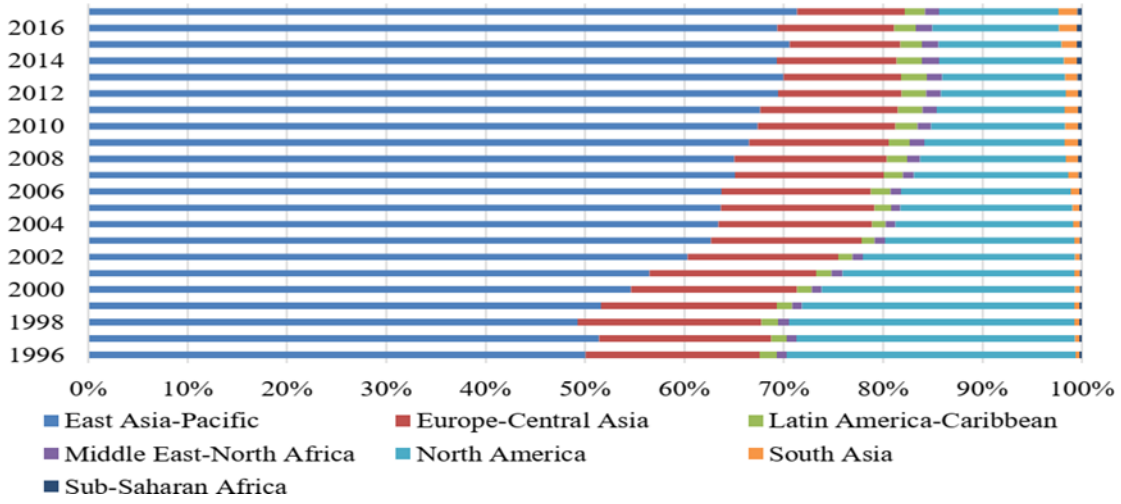
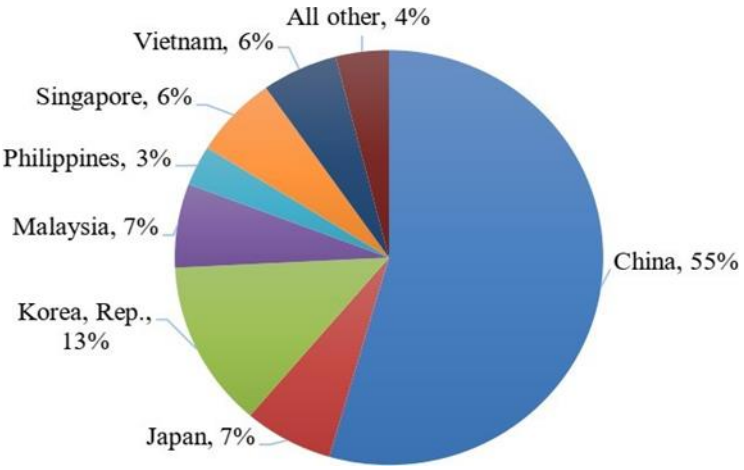


Figure 2.9 Share of intermediate goods (Electronics) in East Asia Pacific trade, 2017[51]

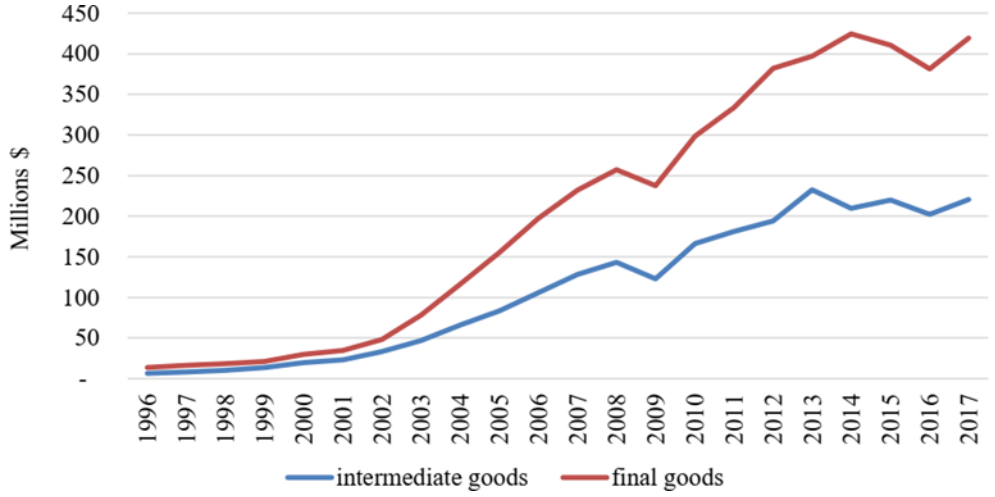


Source: Torsekar and VerWey, 2019, p.6-7

[50] EAP's exports of intermediate goods as a share of the region's total manufacturing exports-a measure of GVC participation-was higher than those of any other region at 16 percent. Notably, a growing majority of EAP's electronic goods trade (i.e., both intermediate and final goods) during 1996 -2017 was conducted within the region; intra-EAP trade in electronic goods grew from 50 percent of world trade in 1996 to 71 percent as of 2017" (Torsekar and VerWey, 2019, p.6).

[51] "[...] regional integration is high, and intermediate goods drive nearly three-quarters of total intraregional electronics trade, with China, Hong Kong, South Korea, and Malaysia being the largest contributors. At the same time, the region's electronic products sector has attracted substantial amounts of FDI from MNCs. During 2003 - 18, capital investments into the region amounted to $270 billion, much of which was directed towards low-value-added manufacturing activities" (*Ibid.*).

Figure 2.10 Chinese exports (intermediate and final goods), ICT, 1996 -2017 (millions of dollars)



Source: Torsekar and VerWey, 2019, p. 8

These trends eloquently show that the Chinese economy has started a shift along the Global Value Chain (particularly in the ICT sector) towards higher value- added production segments (while the gap between intermediate and final goods exports continues to widen), testifying the ongoing upgrading towards a true innovation economy and a gradual move away from its initial status as mere world's factory (Torsekar and VerWey, 2019*;* Baldwin and Lopez-Gonzalez, 2013).

Indeed, roughly two-thirds of electronic goods sold in China in 2015 are attributed to Chinese brands, reflecting the growing number of local companies that have progressively assumed a lead firm status within several GVCs (domestic and global), thus being able to compete globally. Therefore, the rise of such domestic firms and the increase in exports suggest a high productivity rate (resulting from the increasing upgrading) of the Chinese ICT sector (Torsekar and VerWey, 2019).

The current trend towards higher value-added activities is accompanied by rising wage costs in the Chinese manufacturing sector. Between 2011 and 2016, labor costs are estimated to have increased by 64%, reaching levels comparable to those in some middle-income countries. Moreover, China's Eastern coastal regions (where most FDI in innovative industries are concentrated) have also experienced a general increase in costs (office rents, land scarcity, utility costs), which in addition to potential currency fluctuations could lead to a decrease in China's desirability in the eyes of foreign multinational companies. In addition to these developments, some analysts (Enderwick, 2011) have observed a general trend towards a strategy aimed at containing any risk in the supply chain in which China participates,

preparing alternative destinations in East Asia itself (China Plus One Strategy)[52].

To conclude, these findings are confirmed by Song et al.'s (2021) analysis on the *Path for China's tech industry to participate in the current reconstruction of Global Value Chains*. Song et al. show that, with the changing in nature of Globalization, Global Value Chains (GVCs) are undergoing a new restructuring on a global scale (as analyzed in Chapter 1), leading industries of different countries to participate in the reconstruction of GVCs along different paths (also according to their different level of competitiveness), i.e. active embedding in Global Value Chains (GVCs), constructing National Value Chains (NVCs), and creating Regional Value Chains (RVCs). With reference to China's most competitive high-tech industry, Song et al. utilize their analytical framework[53] of the path of a Country's participation in the reconstruction of Global Value Chains along with their Value-Added Revealed Comparative Advantage index (VRCA) and affirm that China's electronics and optical products manufacturing industry "tend toward indigenous innovation while dominating[54] the Regional Value Chain […], integrating Global and Domestic Value Chains, to achieve the domestic and international double cycle goals" (Song et al., 2021, p.1), thus enhancing China's status.

2.4. Not coming home

Between 2001 and 2018, the US-China trade relationship was characterized by a phase where the existence of vast technology gaps and high economic complementarity allowed ample space for collaboration, creating a mutually beneficial landscape for both parties, as well as the rest of the world. During this time, China was keen on learning from the American experience and adopting best practices from the West to serve as useful guidelines for its domestic economic reform. Meanwhile, the US viewed the rise of China as a favorable factor for global stability and development. However, the 2008 economic crisis proved to be a foreshadowing of the current dispute scenario between the two countries. The crisis revealed

[52] "[...] China plus one strategy, whereby firms pair their China investments with investment in a second facility in a nearby Asian economy" (Enderwick, 2011, in Torsekar and VerWey, 2019, p. 9).
[53] For more information about the use and the explanation of the analytical framework of the path of a Country's participation in the reconstruction of Global Value Chains along with the Value-Added Revealed Comparative Advantage index (VRCA) see (Song et al. 2021, p.3, 5, 7).
[54] "Although China's electronic and optical products manufacturing has certain competitiveness, it has still not reached a world-leading level, and its future path should pay attention to indigenous innovation and indigenous technology, mobile Internet, cloud computing, big data, and the IoT, combined with modern manufacturing and adjusting the industrial chain while simultaneously focusing on wage costs, the exchange rate, financial factors, and adjustment mechanisms, choose a suitable regional to restructure the value chains" (Song et al. 2021, p.6).

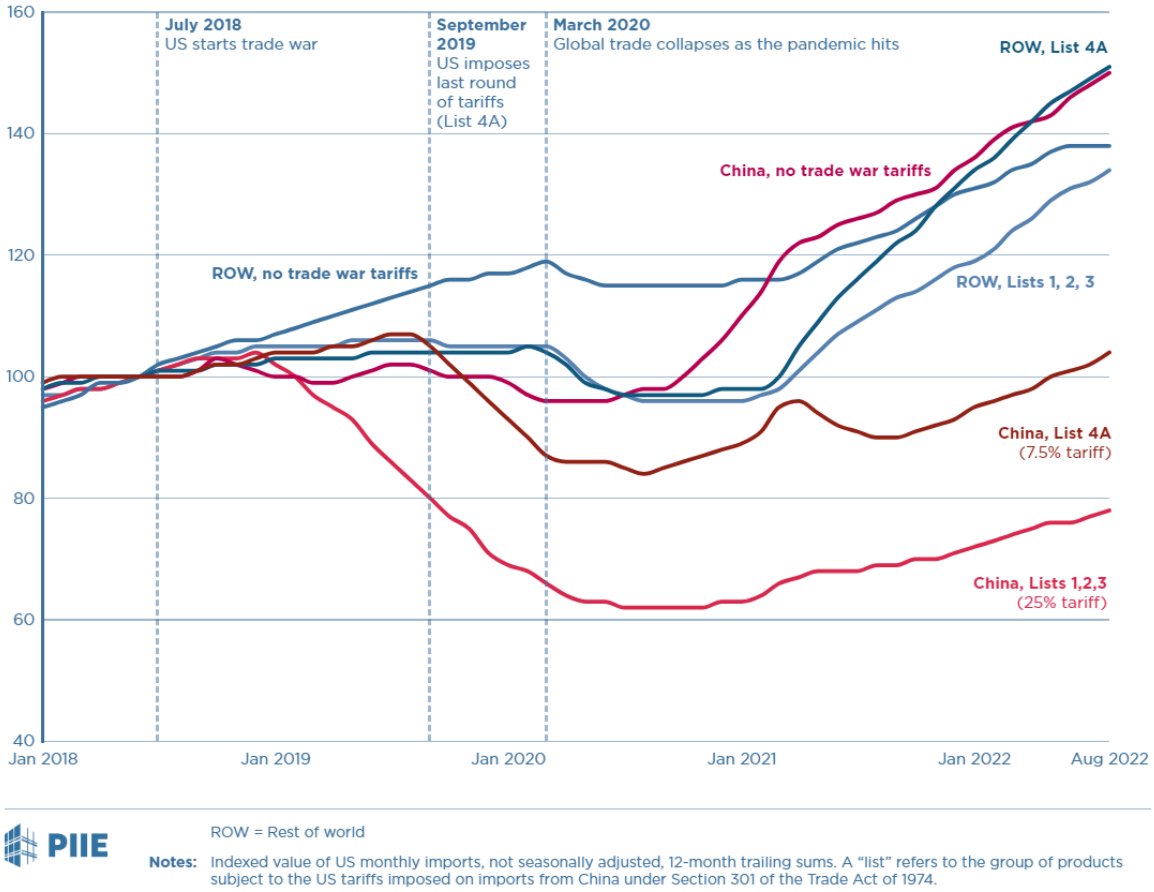
some flaws in the US economy and led Chinese leaders to reconsider the efficacy of West supposedly good practices. Subsequently, China has become more cautious about opening its market, especially in areas such as finance, media, and the Internet. The US has faced increasing competition from China since then, particularly in the field of digital economy development. China has taken the lead in global 5G technology, fiber-optic networks, cellular network equipment, smartphone markets, and e-commerce. Furthermore, China is rapidly catching up in other areas, including AI, big data, cloud computing, industrial internet, and smart city building.

However, the Chinese government's efforts to promote its digital economy have been met with skepticism from foreign competitors. Indeed, China's restrictive data policies and regulations on foreign competition have prevented major foreign digital companies from entering the domestic market, while Chinese companies like Baidu, Alibaba, and Tencent have been allowed to compete in the United States. This has created a trade landscape that lacks reciprocity, further exacerbating distrust between Beijing and the White House, particularly given the two countries' shared focus on accelerating digital transformation as a strategic aspect of their economic development. Despite the long-standing and mutually beneficial economic relationship between the two countries, the consequences of the US-China trade war and current geopolitical tensions led some scholars to predict a potential decoupling of the two economies in the near future.

The concept of decoupling involves different perspectives for the United States and China. From a USA perspective, decoupling involves limiting imports in order to protect or repatriate American jobs and ensure the security of its civil and military infrastructure (reshoring - coming home). From the Chinese perspective, however, decoupling is a strategic shift from economic growth to economic control. This shift includes three key objectives: reducing China's dependence on foreign countries and corporations for critical technology and products; promoting the dominance of domestic firms; and using that dominance to compete globally (dual - internal and external - circulation)[55].

[55] https://edition.cnn.com/2023/02/08/economy/us-china-trade-record-hnk-intl/index.html, accessed on 29/04/23; https://hbr.org/2021/05/the-strategic-challenges-of-decoupling, accessed on 29/04/23; PIIE, https://www.piie.com/blogs/realtime-economics/five-years-trade-war-china-continues-its-slow-decoupling-us-exports, accessed on 29/04/23.

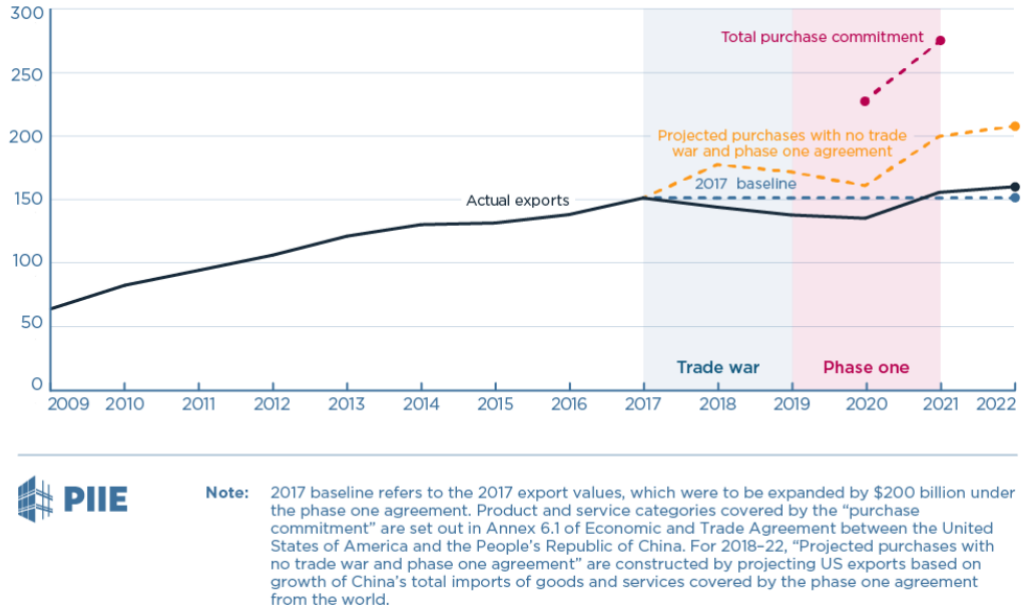
Figure 2.11[56] US imports from China of products hit with tariffs remain low, showing some signs of decoupling; imports of products not facing tariffs have surged, showing little evidence of decoupling



Source: PIIE, https://www.piie.com/blogs/realtime-economics/five-years-trade-war-china-continues-its-slow-decoupling-us-exports, accessed on 29/04/23

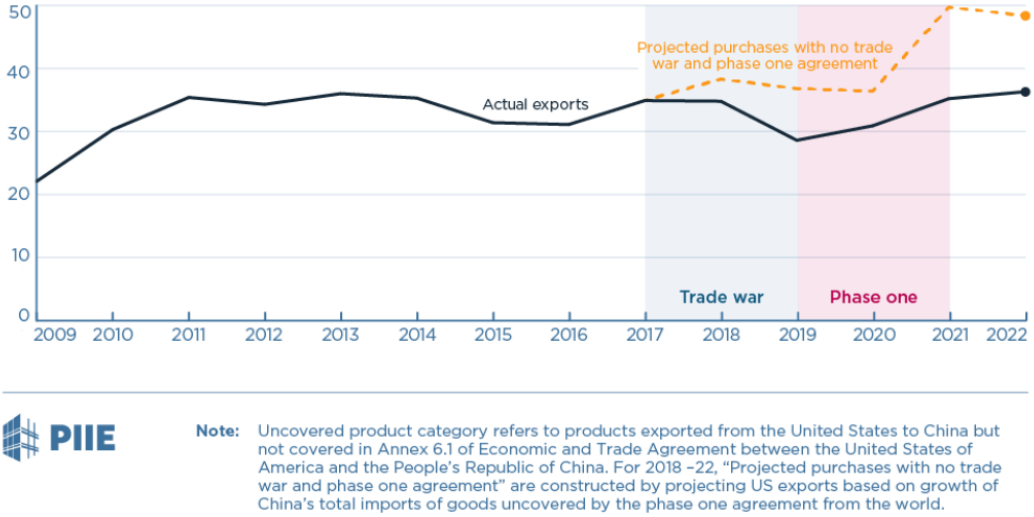
[56] This figure shows the value of US imports from China and the rest of the world by trade war tariff list (2018-2022) (%). For more information see https://www.piie.com/blogs/realtime-economics/four-years-trade-war-are-us-and-china-decoupling, accessed on 29/04/23.

Figure 2.12[57] US exports to China of goods and services covered by the phase one deal continue to struggle



Source: PIIE, https://www.piie.com/blogs/realtime-economics/five-years-trade-war-china-continues-its-slow-decoupling-us-exports, accessed on 29/04/23

Figure 2.13[58] US exports to China of products not covered by the phase one deal continue to struggle



Source: PIIE, https://www.piie.com/blogs/realtime-economics/five-years-trade-war-china-continues-its-slow-decoupling-us-exports, accessed on 29/04/23

[57] This figure shows the US exports to China of goods and services covered by the US-China phase one deal (2009-2022) (billions USD). For more information see https://www.piie.com/blogs/realtime-economics/five-years-trade-war-china-continues-its-slow-decoupling-us-exports, accessed on 29/04/23.

[58] This figure shows the US exports to China of goods not covered by the US-China phase one deal (2009-2022) (billions USD). For more information see https://www.piie.com/blogs/realtime-economics/five-years-trade-war-china-continues-its-slow-decoupling-us-exports, accessed on 29/04/23.

By looking at their trade relationship (2018-2022), recent US-China imports and exports data show that the two economies are becoming less directly interdependent.

The policy implications of this preliminary evidence of a decoupling scenario are mixed and remain imperfect. There could be advantages to diversifying[59] certain products in cases where production or consumption is overly concentrated in one geographic location. Reducing direct dependence in such extreme circumstances may reduce the risk of disruptions due to climate change (floods), health (pandemics), or geopolitical issues (military conflict), and may also limit a country's ability to restrict trade flows for non-economic purposes.

However, there are also negative consequences[60] to consider. Firstly, there are expenses related to finding new suppliers or customers. Secondly, reducing bilateral engagement in cases where it is not necessary may lead to a decreased ability to diversify and consequently heighten exposure to domestic or third country shocks. This is due to the fact that if the United States and China continue to trade with the rest of the world, shocks affecting one country may still have indirect effects on the other through price changes.

In any case, the trade relationship between the US and China is undoubtedly undergoing transformation. Policymakers need to interpret the evidence prudently and guarantee that this potential shift results in favorable outcomes as it will be discussed at the end of this section. The current market tensions and digital transformation, the potential US-China economic decoupling, along with the severe global economic consequences arising from the Covid-19 pandemic, the global inflation and the Russia-Ukraine military conflict have accelerated a trend of GVC reconstruction that was visible even before the US-China trade war (2018) (Fariselli P., 2020; Wang H. and Miao L., 2022).

China’s diminishing competitive advantage (lower labor costs, a devalued RMB and lower export tax rates) against other low-cost emerging economies started in 2015. Since then, China has developed comprehensive plans aimed at upgrading its industries. These strategies include enhancing the quality of its products and equipment, increasing investment in research

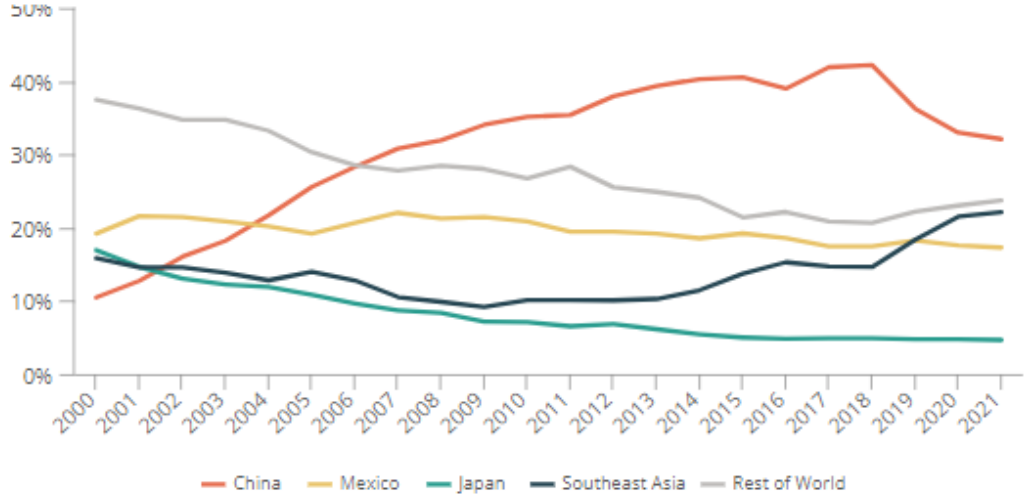
[59] According to the evidence, the United States is increasingly importing assembled products from countries other than China. This shift is partially due to trade diversion, whereby the United States purchases more expensive imports from third-party countries instead of China, due to tariffs. This import shift aligns with other data indicating that countries such as Vietnam, as well as others in East and South Asia, are trading more, including with the United States, in response to the US-China trade war. In order to serve US consumers without paying the trade war tariffs, companies may be establishing a separate assembly facility in Vietnam (the "China plus one" strategy). The same companies may continue to manufacture for the Chinese market (the "in China for China" strategy) as well as other countries without imposed tariffs on imports from China (for more information see PIIE; Wang H. and Miao L., 2022, p.94).

[60] Redundant investments may generate greater costs. This includes the initial expenditure of setting up a new assembly plant as well as possible additional and ongoing expenses linked to running two smaller-scale supply chains, instead of one larger chain based in China (PIIE; Wang H. and Miao L., 2022).

and development, and prioritizing technological innovation. All these efforts have been part of China's attempt to move upstream in the industrial chain by manufacturing mid- to high-end products, and to participate more deeply in higher-margin and higher-value-added sectors (hi-tech industry). As a result, several lead firms with particular reference to the electronics industry (Apple) started to consider a shift of part of their supply chains (low value-added, labor-intensive activities) out of China to more cost-effective destinations in South-East Asia (Vietnam) or to India. Nevertheless, although China's centricity as the world's factory has begun to fade, by virtue of a skilled workforce, excellent infrastructure capacity, and an unrivaled speed of hardware innovation, it remains an outstanding manufacturing hub. Therefore, leaving China is not that simple (*Ibidem*).

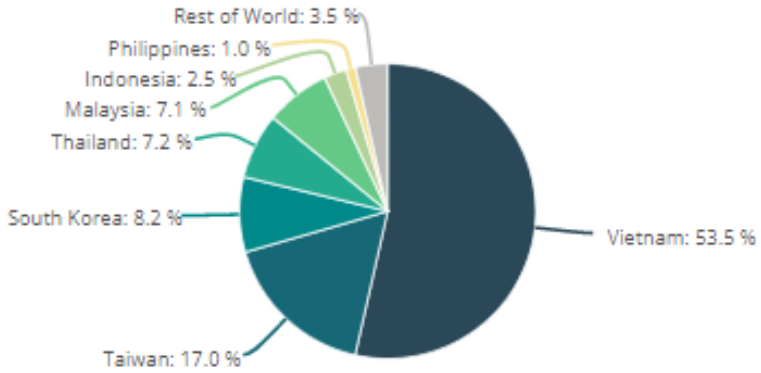
The electronics and machinery sector acts as a valuable means to examine the ongoing reconstruction of global supply chains. This industry represents the largest category in global trade in terms of value and it is one in which China dominates both production and exports, with established intra-Asian supply chains. Even though preliminary evidence of a US-China decoupling scenario emerges, the evidence shows that the Asian supply chain has remained largely unchanged, with some indications of diversification away from China. Figures 2.14 and 2.15 illustrate a decline of 10 percentage points in China's electronics exports to the United States from 2018 to 2021. Although some of the low value added activities and assembly formerly undertaken by China have been taken up by Southeast Asian countries, particularly Vietnam, this shift has had marginal benefits. Moreover, despite the global economic downturn brought on by the Covid-19 pandemic, China's overall manufacturing levels have remained consistently high. Relative to China's overall production volume, the shift to South-East Asia is negligible at the global level (Figure 2.16) (https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23).

Figure 2.14[61] China declines, Southeast Asia rises in electronics exports to US



Source: https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23

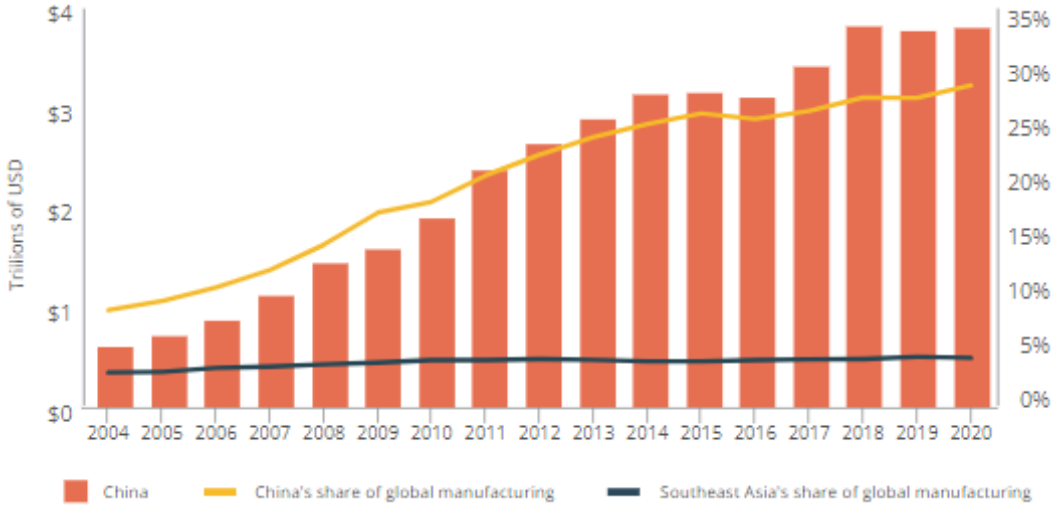
Figure 2.15[62] Vietnam made up more than half of the export decline from China



Source: https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23

[61] Figure 2.14 shows share of each country in US imports (customs value in US dollar).
[62] Figure 2.15 shows the composition of US imports increase by country of origin from 2018 to 2021. All data for Electrical Machinery and Equipment category only.

Figure 2.16 China's manufacturing weathered the pandemic fine

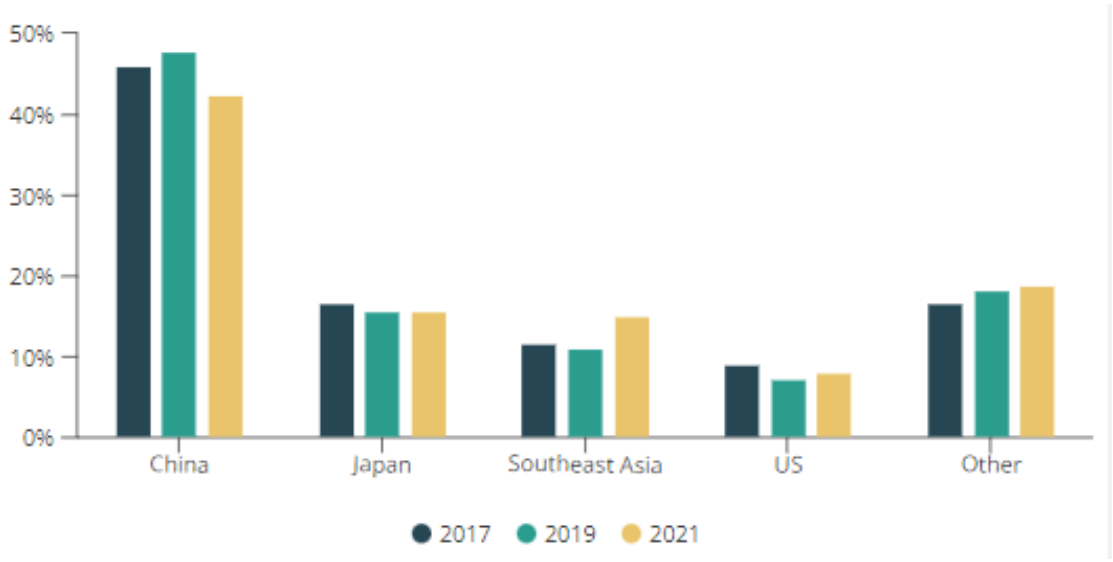


Source: https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23

In addition, an analysis of Apple's production strategies in the consumer electronics industry – far from being a comprehensive assessment of Asian supply chains - can offer insight into electronics supply chain movements and can provide a more realistic representation of the recent changes in countries' relative positions along the Smile Curve within the GVC system (*Ibidem*).

Figure 2.17 indicates that Apple has slightly reduced the number of its manufacturing locations in mainland China from 47.9% to 42.4% between 2019 and 2021. This modest decrease is more indicative of Apple's supply chain consolidation efforts over the period rather than a significant decoupling from China. In fact, the company has reduced its total supplier sites by 25% during the same period, with China-based sites representing a significant portion of the reduction. Further analysis of these suppliers reveals that many of the sites removed from China were specialized in labor-intensive work such as packaging and metal production. Meanwhile, Apple added 14 new Chinese suppliers in 2021, with many of them being higher-value, knowledge-intensive manufacturers of intermediate goods like optical components, sensors, and connectors. Much of the labor-intensive work is now being relocated to South-East Asia, which has seen its share of Apple supplier locations rise from 11.6% in 2017 to 15.1% in 2021 (*Ibidem*).

Figure 2.17[63] Apple has reduced its supplier sites by 25% over the pandemic years

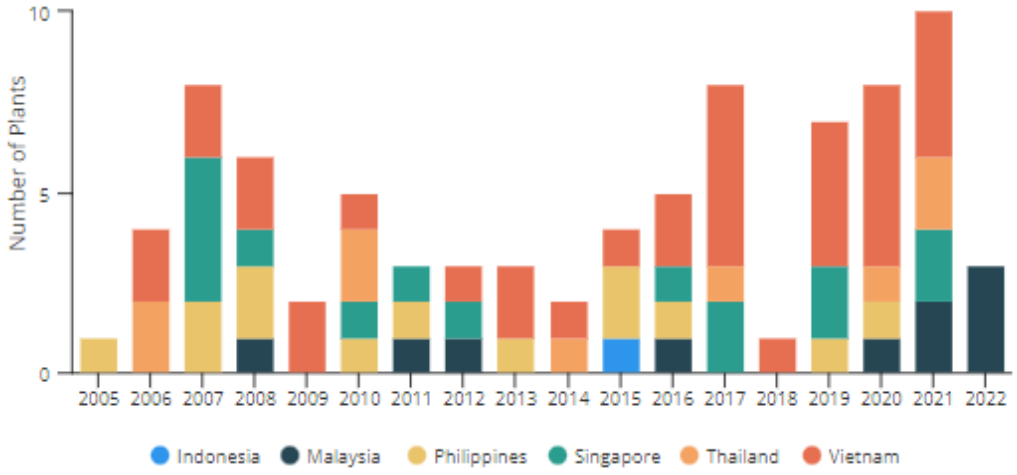


Source: https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23

Within South-East Asian region, Vietnam has been particularly noteworthy (as shown in Figure 2.18). This is partly due to the fact that before the Covid-19 pandemic, 11% of Apple's 200 suppliers, mostly composed of Taiwanese, South Korean, and Japanese firms, already had at least one manufacturing site in Vietnam. Thus, these suppliers were able to expand their operations in Vietnam with relative ease, capturing the low-end assembly and packaging segments that Apple was shifting from China (*Ibidem*).

[63] "The data, which reflects 98% of Apple's production chain, shows the distribution of supplier sites by physical location, not by the headquarters of the firms. Supplier sites totaled 759, 799, and 611 for the three years shown. Apple's reduction of its supplier sites has also led to a modest redistribution of suppliers across countries" (https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23).

Figure 2.18[64] Apple suppliers have eyed Vietnam for expansion



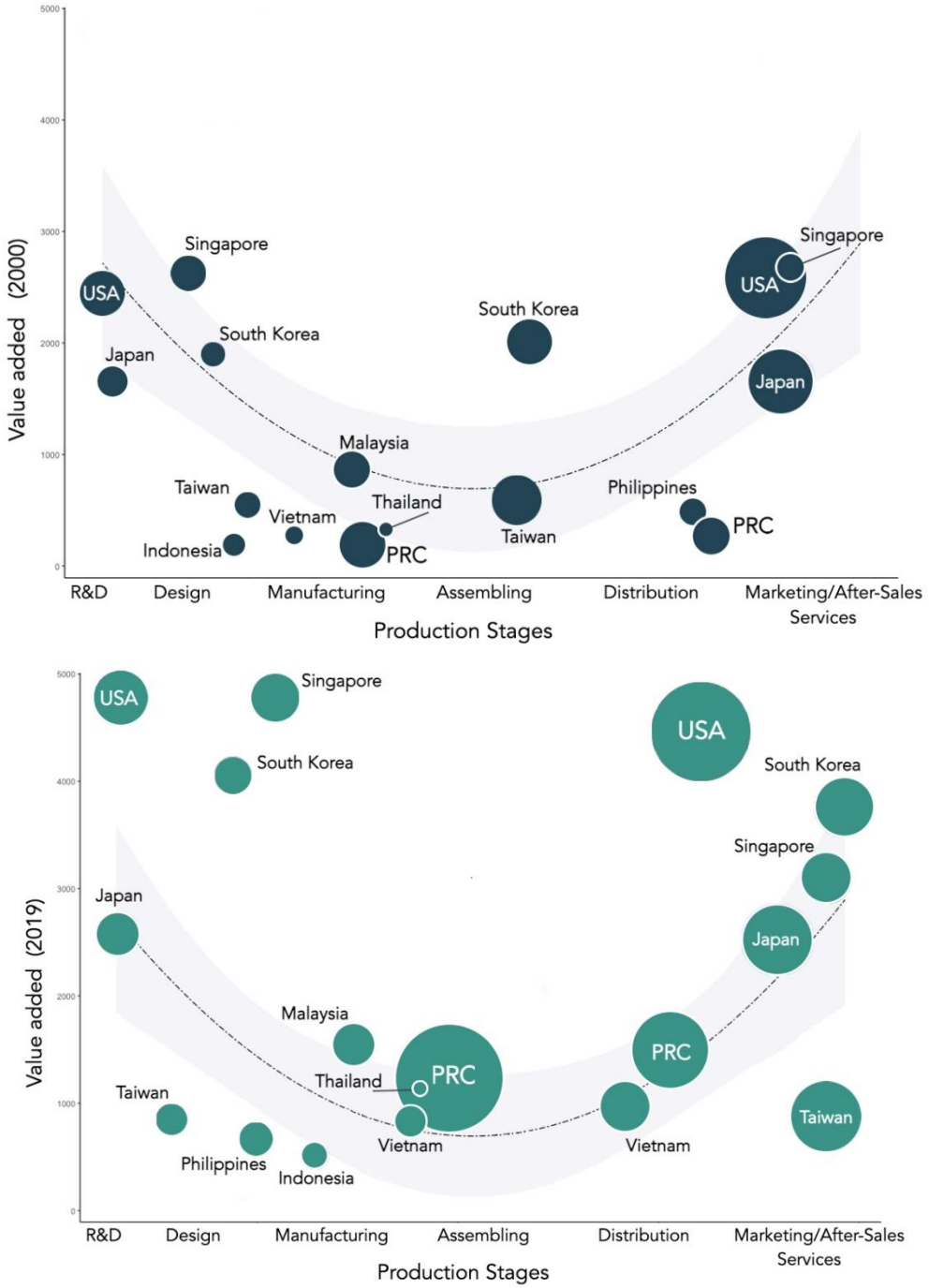
Source: https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23

Therefore, Apple's supply chain composition has remained largely unchanged as before the US-China trade war and Covid-19 pandemic. That is, research and development, as well as the most knowledge-intensive parts of the value chain, are still conducted in more advanced economies. Meanwhile, end assembly and production of the simplest components are being gradually shifted from China to lower-cost countries like Vietnam. Indeed, Apple still depends on the Asian manufacturing ecosystem, with China playing a significant role (*Ibidem*).

Furthermore, by utilizing trade and labor cost data, the countries included in this study can be positioned on the Smile Curve (Figure 2.19) within the GVC system. The findings indicate that their positions along the curve have remained relatively stable over the past twenty years. Developed economies like the United States, Japan, and South Korea occupy the higher and most profitable parts of the Global Value Chain, while South-East Asian countries (Vietnam) and China - although it has started a shift (particularly in the ICT GVC) towards higher value-added production segments - continue to remain at the bottom of the curve (*Ibidem*).

[64] "The data shows the number of plants opened by Apple's suppliers in respective countries, not when these suppliers began production for Apple" (https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23).

Figure 2.19[65] Positions along Smile Curve see little change, 2000 vs. 2019



Source: https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23

[65] "The x-axis represents country/industry position in the production stage based on ADB MRIO data on Average Propagation Length. The y-axis represents labor productivity using ILO data on mean nominal monthly earnings by economic activity in PPP adjusted 2017 US dollar. The size of the circles represents total value added to the Global Value Chain by country/industry. Methodology is adapted from" Meng, B., Ye, M. and Wei, S.-J., (2020), Measuring Smile Curves in Global Value Chains (https://macropolo.org/analysis/supply-chain-diversification-quitting-china-is-hard/, accessed on 29/04/23).

In conclusion, the analysis suggests that the diversification of the machinery and electronics industry's production network from China to other South-East Asian countries (Vietnam) is modest and negligible at the global level. The trend[66] indicates that the supply chain's composition will not deviate from the current trajectory (no reshoring[67] - not coming home), with China continuing to be the factory of the world in consumer electronics production. While South-East Asia will capture some of the assembly and basic production that China is moving away in its attempt to climb up the Smile Curve, Vietnam will remain a satellite of the global factory. Therefore, a complete decoupling from China appears unlikely in the near future (*Ibidem*).

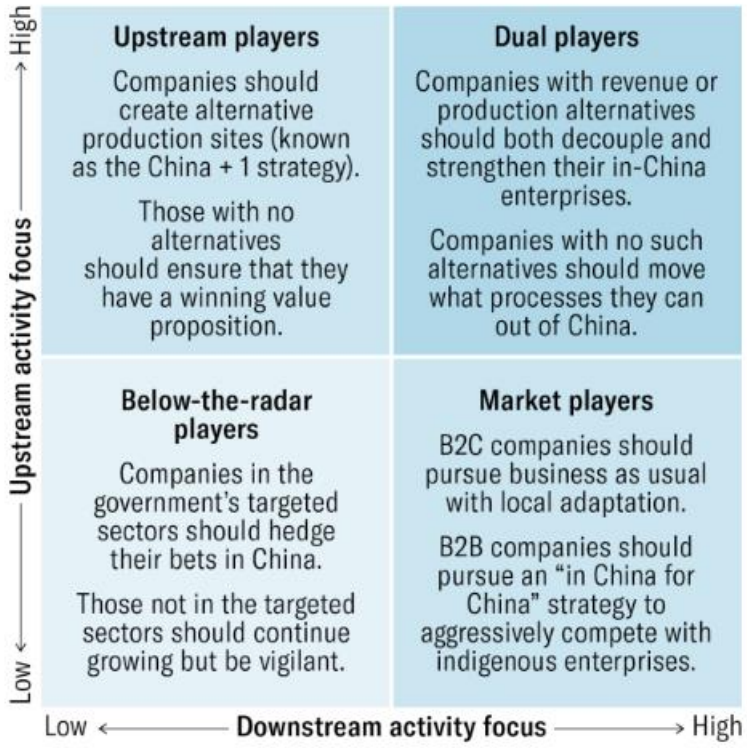
In any case, the abovementioned US-China decoupling scenario can have potential implications both for companies operating in China and for South-East Asia regional development.

From a business perspective, when examining foreign companies operating in China two dimensions can be used to categorize them: their focus on upstream activities such as raw materials, components, and production; and their focus on downstream activities such as distribution, marketing, and sales within China. Figure 2.20 demonstrates that a foreign company's response to US-China decoupling will be determined by its position on this graphic. The importance of the market opportunity in China is measured on the vertical axis, while the importance of China's production capabilities to the company's strategy is measured on the horizontal axis (for more information see https://hbr.org/2021/05/the-strategic-challenges-of-decoupling, accessed on 29/04/23).

[66] These findings are supported by ADB, UIBE, WTO, IDE-JETRO, DERF's evidence (2021) and confirmed by Gereffi & Wu's analysis (2020) on production strategies of GVC lead firms and first-tier suppliers in athletic footwear (Nike) and electronics (Apple and Foxconn) GVCs, and by Charoenwong, et al.'s analysis (2020) on American companies' production network redesign trends. According to Gereffi & Wu (2020), on the one hand, labor and raw material cost increase, the uncertain global geopolitical scenario, the current digital transformation and the need for faster speed to market to meet consumer demand are likely to increase the role of automation (automated factories) in facilitating nearshoring and diversification as strategic alternatives rather than a complete decoupling from China, leading to greater Regionalization within athletic footwear and electronics value chains. ADB, UIBE, WTO, IDE-JETRO, DERF (2021), on the other hand, affirm that firms redesign their production networks to get close to the suppliers and customers facing a fundamental trade-off in terms of costs of production and resiliency of their supply chain. Moreover, Charoenwong, et al. (2020) show that firms are not coming home or completely decoupling in terms of localizing production. Instead, those with majority foreign customers tend to decrease their domestic supplier share while those with majority domestic customers tend to increase their domestic supplier share.

[67] The economic and trade interdependence brought about by the Globalization of production networks is difficult - if not impossible - to eradicate. In fact, the entire re -localization of supply chains to the US would not consist in a simple transfer of production capacity (reshoring) but would require a real reconstruction of the skills currently dispersed along the GVC system. These skills have taken decades to develop and consolidate and are not easily replaceable. Since the geography of production networks does not coincide with political geography, this would lead to a redistribution of scarcity, exacerbated by restrictions on input and knowledge flows on a global scale, which would raise production costs and commodity prices (Fariselli P., 2020, p.49).

Figure 2.20 Four strategies for foreign companies in China



Source: https://hbr.org/2021/05/the-strategic-challenges-of-decoupling, accessed on 29/04/23

From the South-East Asia regional development perspective, on the other hand, the economic cost of US-China decoupling will be very high (Chen L., 2021).

In the past, South-East Asian countries have greatly benefited from the cooperative competition between the United States and China. This mutually beneficial relationship allowed these South-East Asian countries to benefit from capital inflows, technology diffusion, and access to both large markets. In particular, the South-East Asia region's economic growth and development was driven by the interlinkages of global demand, supply, and regional production sharing through GVCs, which helped it become the world's largest exporter platform. The so-called Factory Asia system operates through a multi-layered network of intensive cross-border activities. However, the US-China decoupling could lead to uncertainty and make the region less appealing to international capital and outsourced activities. Decoupling could also affect the digital transformation trajectory both on a regional and global scale. If the US-China decoupling results in two competing blocs (Splinternet scenario), the South-East Asia region needs to ensure that the two blocs overlap, strengthening its connection with both economies (*Ibidem*).

In that sense, developing the digital economy can play a vital role in strengthening regional cohesion and enhancing the region's competitiveness in the global economy. In order

to do so, South-East Asia needs regional collaboration in consumer protection, data flow, cybersecurity, IPR protection, and dispute resolution. By achieving regional integration and digital transformation in a mutually reinforcing manner, South-East Asia region could even increase its status in GVCs in the digital era. Therefore, deepening regional integration and promoting the digital economy [68] will remain the core of South-East Asia's long-term development strategy in its attempt to mitigate the negative consequences of a potential US-China decoupling (*Ibidem*).

As a conclusion, in response to the US - China imperative to safeguard their national security and to foster their own economic and technological development, a major recalibration of their economic relationship along with a new trade policy approach is required. As previously mentioned, in the past, the relationship between the United States and China was primarily driven by a shared goal of "helping China align with the world, i.e., to participate in and conform to a world order that […] was largely established and […] led by the United States." Since 2001, "US trade negotiations with China have generally focused on China's often imperfect compliance with the US view of how WTO members should regulate their economies". However, over time Chinese government has increasingly and explicitly rejected the US view on economic regulation and international economic relationships. Instead, China wishes to be seen as a champion of Globalization (with Chinese characteristics) tailored to its own unique economic and political systems. In order to prevent that a US-China potential decoupling proceeds uncontrolled, future negotiations could adopt a new paradigm. "Rather than focusing on China's level of conformity with the existing world order, this new paradigm would focus instead on interoperability, i.e., explicitly acknowledging China's different approaches and […] seek harmony despite differences" among the parties. Interoperability could be implemented in a way that respects both countries' sovereignty, resulting in a more proactive and clear response to the challenges presented by their economic development model. High-level negotiations on a wide range of bilateral issues, including economic and national security issues, would be necessary to implement this approach. Hopefully, this process could increase trust and predictability in the US-China economic relationship as both sides would recognize the value of transparency in their economic policies and reasonable proportionality in their conduct (Wang H. and Miao

[68] To accelerate digital transformation in Asia, policies in terms of the following aspects are worth considering: supporting innovative and inclusive economic growth and regional development; improving digital connectivity, building data- related infrastructure and rule setting; promoting cooperation in digital economy and e-commerce development (*Ibidem*).

L., 2022, p.29).

2.5. From imitation to innovation

The Information and Communication Technology (ICT) sector has facilitated a significant internationalization and Globalization of economic activities in recent decades, allowing new regions to emerge as relevant investment, production and assembly locations within new organizational business models. Nonetheless, their status as latecomers (Grimes S., Yang C., 2017/2018, p.133) has led such emerging countries to face numerous challenges in trying to catch up with the more developed ones, which are dominating the trajectories of technological development.

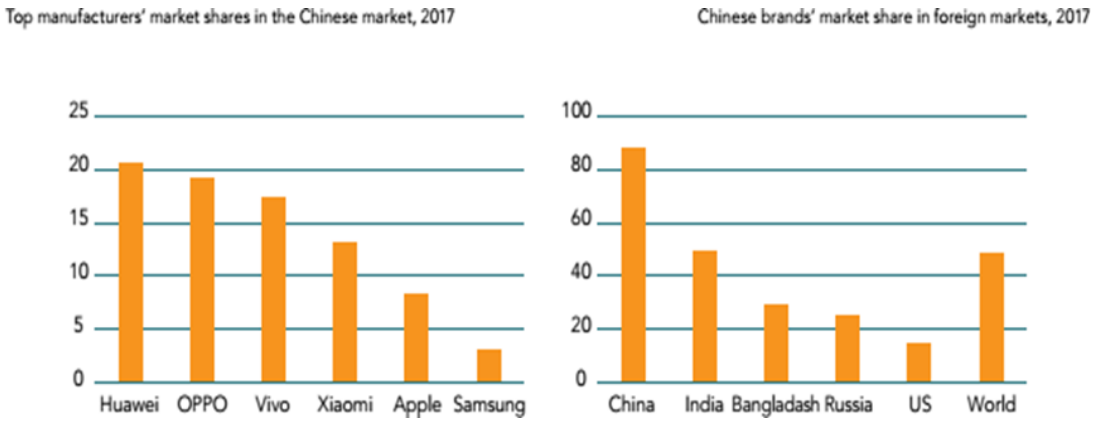
These premises prove to be true with reference to China, which faces significant challenges in its transition from world's factory to a more innovative economy. Historically, following its integration into the ICT GVC, the initial policy system introduced by the Chinese state focused primarily on initiatives involving an exchange between domestic market access granted to foreign transnational companies and technology transfer from the latter (joint ventures) to local Chinese companies. The high level of dependence on such resources relegated China to a status of profound initial weakness. Although some sectors (ICT) benefited positively, the overall technological spillover framework was, in fact, unsatisfactory also due to the low absorptive capacity of local Chinese companies (Liu, Xie, Wu, 2015; Grimes S., Yang C., 2017/2018; Chen, 2014).

Over time, however, due to the global financial crisis[69] (2007-08) as well as the shift of the locus of innovation from Western corporations to the Asian continent, China's technological capabilities have undergone a great development. This has led to the rise of several successful domestic brands[70] and digital platforms, able to compete in the domestic and international markets (Figures 2.21 and 2.22) (Liu, Xie, Wu, 2015; Jiang, Branzei, Xia, 2016, in Grimes S., Yang C., 2017/2018, p.135).

[69] Within the post-crisis scenario, China needed to reconfigure its development strategy by moving away from a world factory model towards higher value-added activities (Chen, De Lombaerde, 2013).

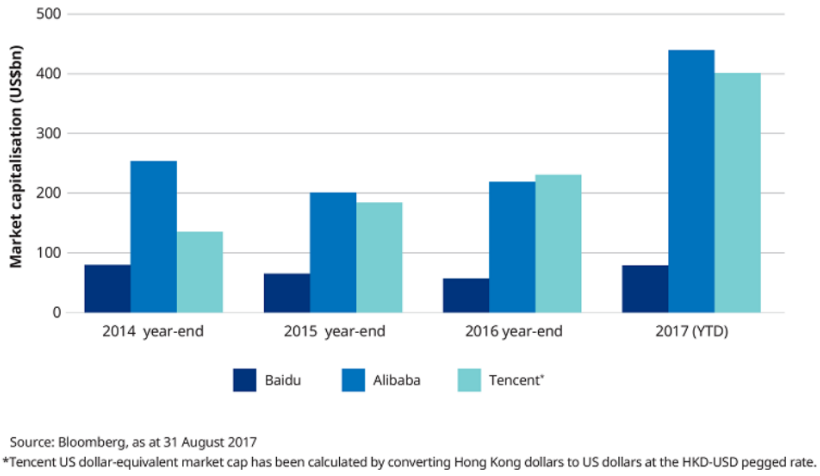
[70] Huawei, Xiaomi, Oppo, Vivo, ZTE, TLC, Lenovo have emerged within the electronics industry landscape. Similar to other companies, these brands are also heavily dependent on intermediate inputs sourced on a global scale. Some scholars (Thun, Sturgeon, 2017, in Grimes S., Yang C., 2017/2018, p.140) argue that it is almost impossible for a late-developing country to achieve the development of a domestic industry within such a tech-intensive sector. Nevertheless, just as Taiwanese and South Korean companies (Samsung, LG, HTC, Acer, Asus) learned how to become leading brand companies, Chinese companies have started to move in that direction as well. However, the low profitability of some of them (Huawei, Oppo and Vivo, 5%) compared to the profits captured by some leaders (Apple, 91%) is a worrying aspect for several Chinese policymakers (Thun, Sturgeon, 2017; Sui, 2016; Grimes S., Yang C., 2017/2018; Sun Y., Grimes S., 2015/2016).

Figure 2.21 Rise of new Chinese smartphone brands (Domestic and Foreign Market) (2017)



Source: World Trade Organization (2019), p.91

Figure 2.22 BAT market capitalization (2014-2017) (USD)



Source: https://www.schroders.com/en-ch/ch/professional/insights/five-charts-that-explain-the-rise-of-chinas-technology-giants/, accessed on 29/04/23

The political economic model adopted by China has strongly influenced its policies towards more technology autonomy (*Ibid.*), especially after the financial crisis (2008). Even though the intellectual property (IP) rights of technological sources (key components used in assembly activities and intangibles) tend to be controlled by Western leading companies and located in regions outside the Chinese state and in areas of technological innovation from which China is excluded (Grimes S., Yang C., 2017/2018; Breznitz, Murphree, 2011), China's leading role within the regional and global ICT GVC systems eloquently shows how the phenomenon of technological upgrading has in fact begun.

Indeed, in their attempt to overcome the technological gap with more developed countries as well as the continuing dependence on foreign technological sources, Chinese

state policymakers have come to adopt an approach aimed at reducing this subalternity. This strategy of transition towards an indigenous innovation[71] comprises a series of measures (setting domestic standards and providing public procurement) aimed at increasing the country's technological capabilities (Grimes S., Yang C., 2017/2018; Cooke, 2013; Liu, Cheng, 2011), progressively contributing to China's ultimate goal: the complete replacement of foreign companies (with domestic ones) operating in the domestic market and the achievement of a developed and independent economy (complete economic self-sufficiency) (Fariselli P., 2020, p.49). Indeed, this is a double path that opens and intertwines towards the domestic market (internal cycle) and the global market (external cycle). China seeks to move away from the export-led and foreign-led GVCs and investment-driven development model to a domestic market-driven development model with a rebalancing of expenditure in favor of consumption, and on indigenous technological presidium in a broad spectrum of sectors (at varying degrees of technological maturity) in order to develop an internationally competitive domestic hi-tech industry.

China's recently adopted 14th Five-Year Plan (2021-2025) signifies a shift in priorities from quantitative growth to an emphasis on industrial upgrading and a new developmental phase that is more focused on quality and social development, with a greater inward-looking perspective.

In particular, the Made in China 2025 program is a comprehensive plan that strategically combines national interests to make China a Manufacturing Superpower by upgrading its production technologies, both in private and state-owned enterprises. The aim is to develop innovative industrial assets, oriented to market demand and able to allocate resources efficiently. Furthermore, this strategic plan aims to shift the paradigm from 'Made in China' to 'Designed in China' and 'Innovated in China'. This plan focuses on the development of Smart Manufacturing within ten years; issued in 2015, the strategic plan covers the period from 2015 to 2025 and stands as the first of three phases, at the end of which China aims to establish itself as a global manufacturing powerhouse. The second phase, from 2026 to 2035, would see China reach an intermediate level of global manufacturing importance, and at the end of the third, from 2036 to 2049, China aims to achieve global leadership in the very year it celebrates the 100th anniversary of the founding of the Republic (Fariselli P., 2020; Merics,

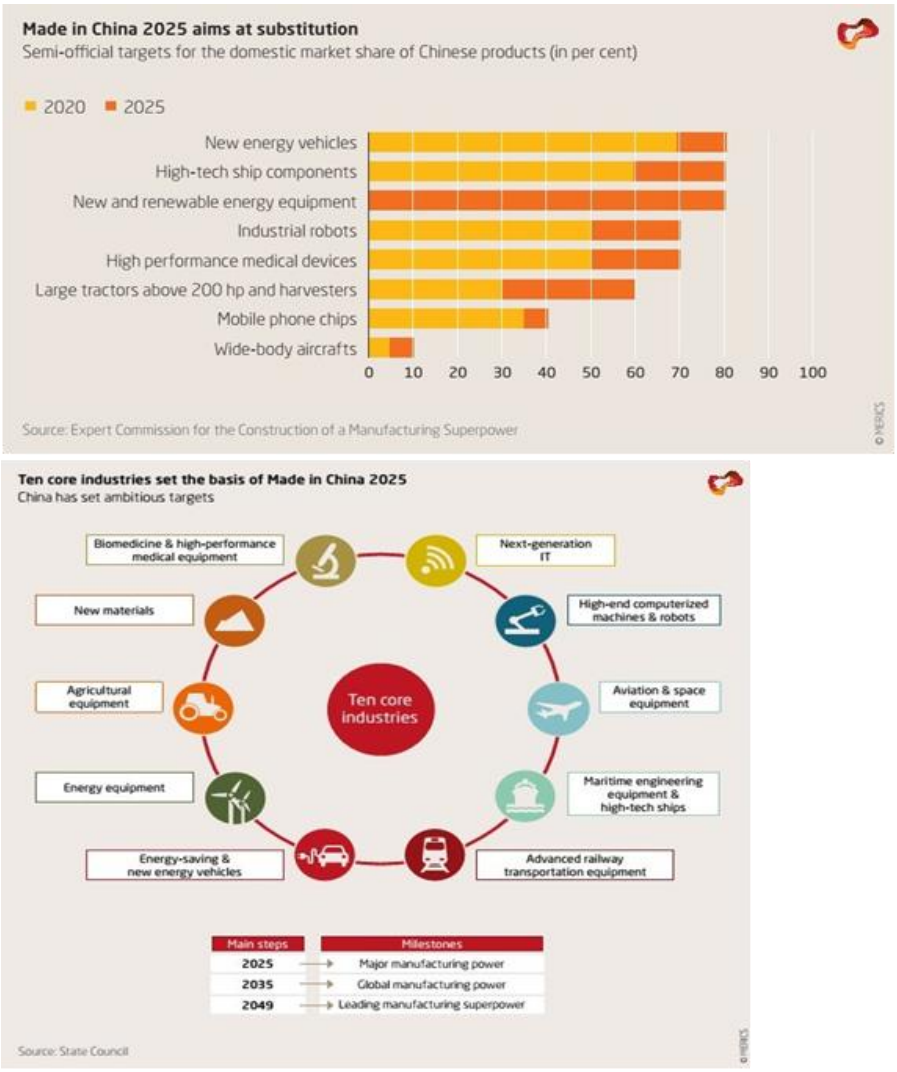
[71] Launched in 2006, this strategy also aimed at mitigating potential negative effects of a lock-in phenomenon of China within the lo part of GVCs. Made in China 2025 and Internet Plus 2015 propose an alignment of the country to the latest technological changes in automation, mobile Internet, cloud computing, big data, internet of things in the modern manufacturing processes and foster the growth of e-commerce (Horner, 2014; MacKinnon, 2012; Grimes S., Yang C., 2017/2018).

https://merics.org/en/short-analysis/chinas-14th-five-year-plan-strengthening-domestic-base-become-superpower, accessed on 29/04/23).

A significant share of this trajectory's target sectors concerns technologies related to national brands in the consumer electronics ICT sector and the internet of things - IoT and its industrial declinations, which ultimately refer to the so-called data economy, i.e., an economy based on digital data, captured by digital platforms, processed to virtualize production, services, work and consumption. The following sections summarize some of these sectors, such as Smartphone, e-commerce, artificial intelligence and 5G (*Ibidem*).

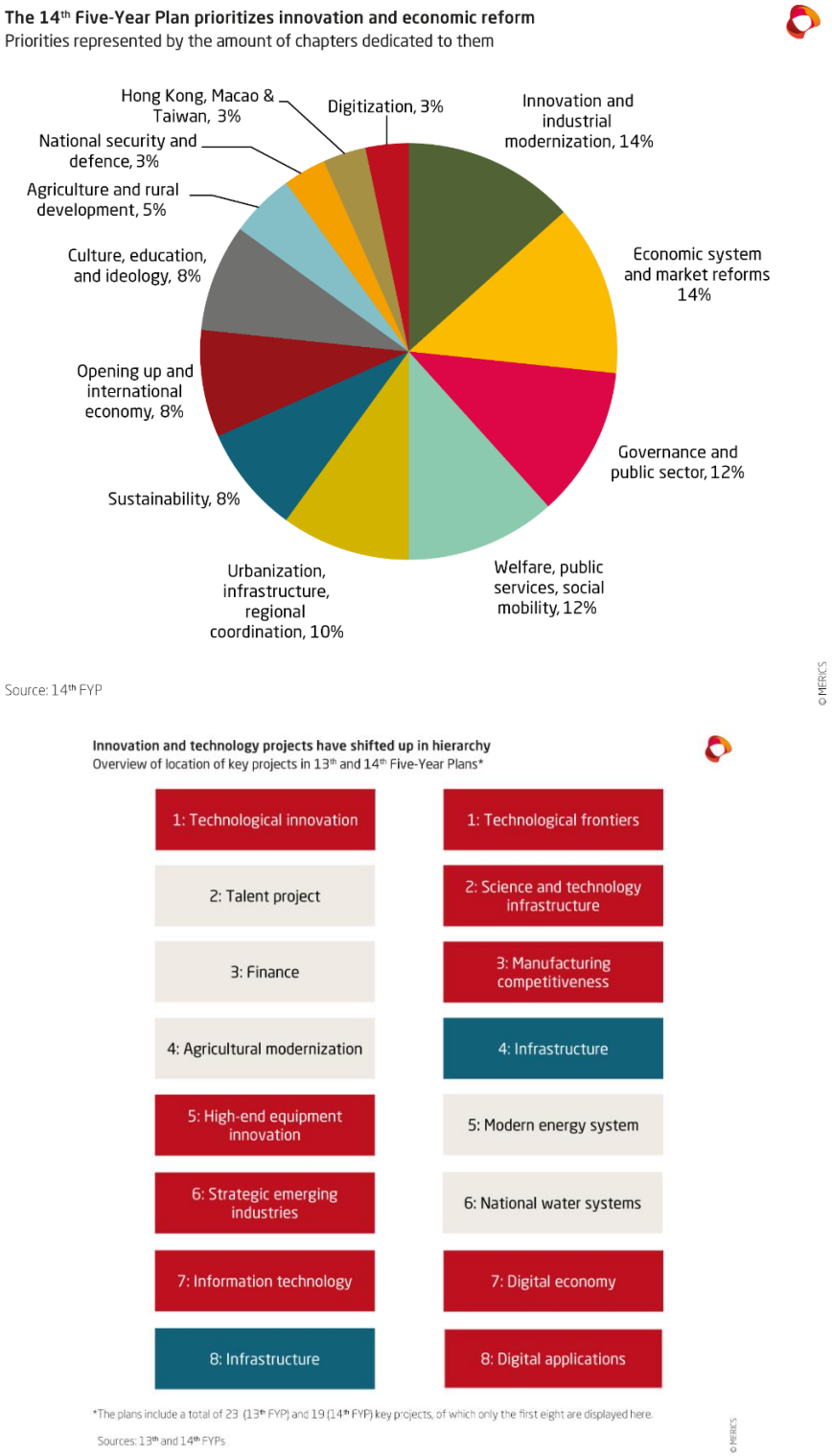
As a conclusion, looking at the current scenario, it is certainly possible to state that, far from a complete technological autonomy, China has embarked on a path of industrial upgrading, fully assuming the status of innovation state (Zhou et al., 2016, in Grimes S., Yang C., 2017/2018, p. 144).

Figure 2.23 Made in China 2025



Source: Wübbeke et al., 2016, p.38; Zenglein M.J. et al., 2019, p. 20

Figure 2.24 14th 5-year plan

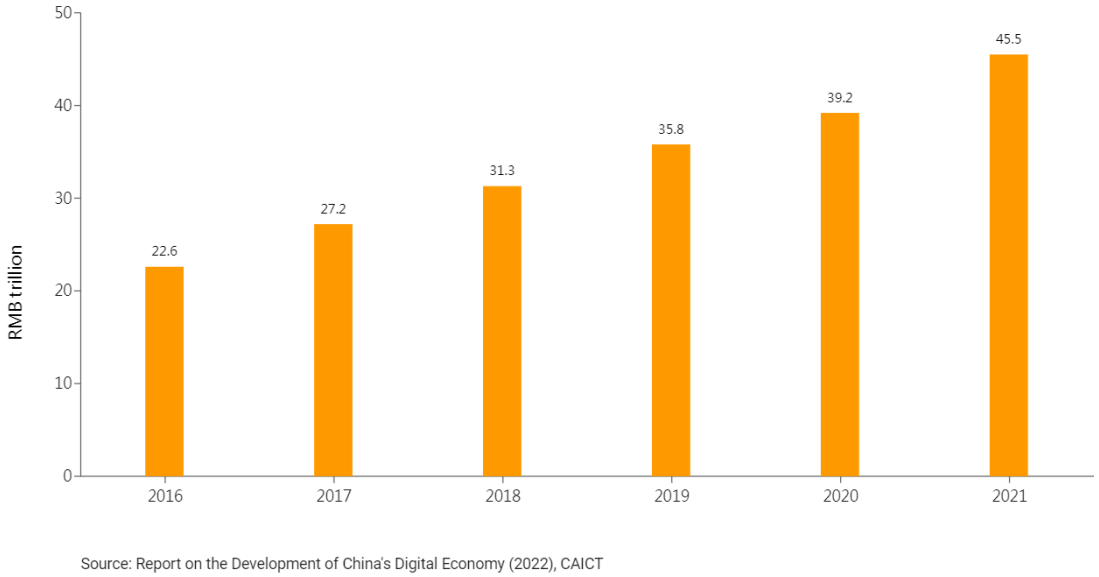


Source: Merics, https://merics.org/en/short-analysis/chinas-14th-five-year-plan-strengthening-domestic-base-become-superpower, accessed on 29/04/23

2.5.1. China's digital rise

China holds the second largest digital economy in the world and has emerged as a leader in several digital technologies (Zhang L., Chen S., 2019; Fariselli P., 2020; ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; Fu X., Zhang J. & Wang L., 2020; Brookings; Wang and Miao, 2022). Certain sectors have witnessed high levels of digitalization, particularly in the consumer electronics ICT sector (smartphone), e-commerce and fintech, artificial intelligence and 5G standards and technology as it will be discussed in this section.

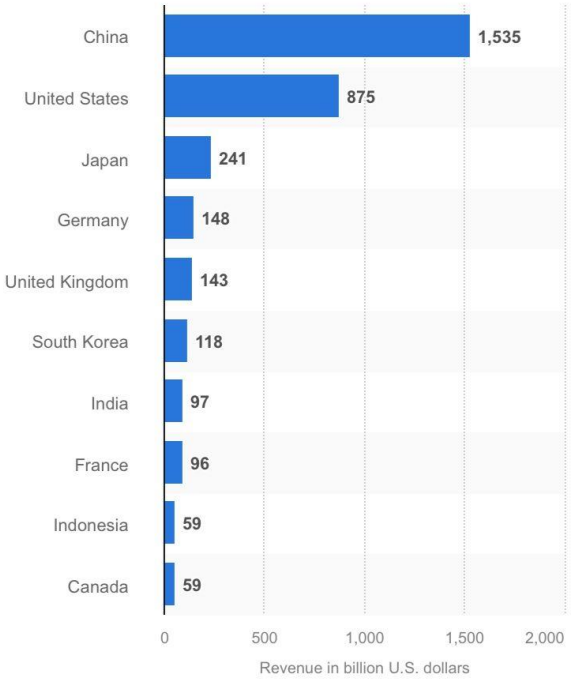
Figure 2.25 Scale of China's digital economy (2016-2021) (RMB)



Source: CAICT, 2022

In the consumer electronics ICT sector (smartphone), China's indigenous technology and industry have made enormous strides, leveraging on ICT GVC learning, widespread entrepreneurship, adaptation to domestic market needs, imitation, as well as on innovation and R&D to achieve a general upgrade. This has led to the rise of numerous domestic brands capable of competing globally as it will be discussed more deeply in the following section. (*Ibidem*).

Figure 2.26 Revenue of e-commerce worldwide by country (2022) (USD billion) (Forecast)

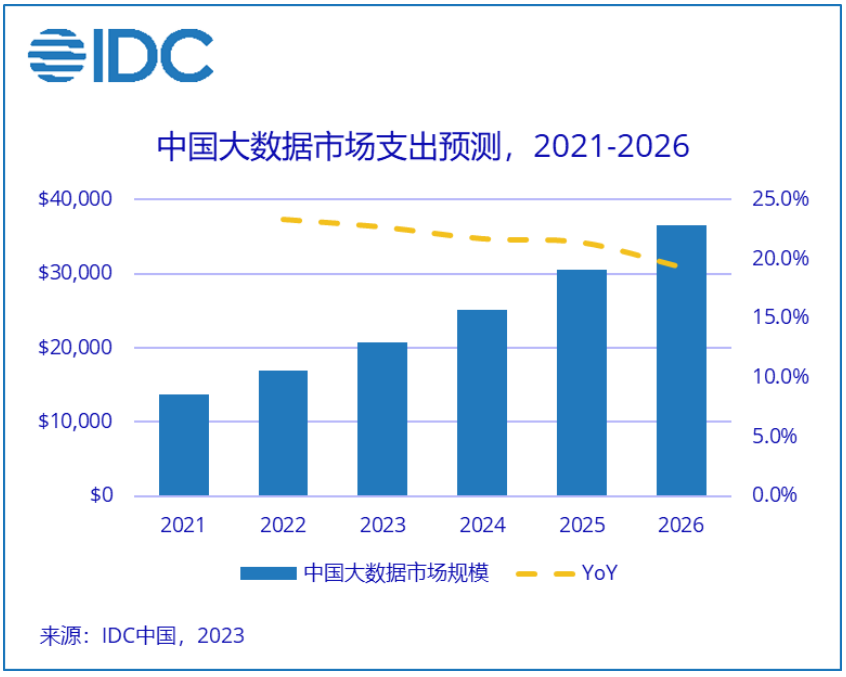


Source: Statista, https://www.statista.com/forecasts/1283912/global-revenue-of-the-e-commerce-market-country#:~:text=The%20Statista%20Digital%20Market%20Outlook,Japan%20with%20241%20billion%20dollars, accessed on 29/04/23

In China, the extraordinary spread of e-commerce and the electronic forms of payment can be explained as a case of leapfrogging from a backward retail and banking market condition, into which low-cost, widespread platforms, applications, and digital network devices have been grafted. In China, as in other developing countries, in the absence of widespread and efficient commercial, logistical, credit and telecommunications infrastructures, there was a leap (and not gradually, as in countries with an established infrastructure) to the use of networked digital technologies. This occurred at a time when the widespread accessibility of these technologies coincided with a phase of formidable economic growth and thus with an increase in the share of disposable income for consumption. The success of Chinese e-commerce - also thanks to electronic payments via smartphones - played a driving role especially in the creation of innovative services, new enterprises and evolving business models. A variety of enterprises emerged: national champions, competitors, start-ups, and a variety of models: B2C, B2B, C2C; social commerce; omnichannel commerce; online + offline; new retail. Not only that, but the big champions have also developed cross-border e-commerce and fintech activities (payments, loans, online funds without bank

intermediation), extending e-commerce (e.g., Tmall Global) and e-payment services (e.g., via Alipay or WeChatPay) to consumers and businesses in more than 60 countries worldwide. At the same time, China's domestic e-commerce market, although the largest in the world, still has a very large potential for growth and evolution. Digital transactions in the Chinese market are linked to the immense amount of digital data (big data) generated by the widespread presence of IoT devices scattered across the country. The abundance of this resource, which is not subject to economic exchange between those who give it away and those who collect it but can be used for economic purposes by those who have access to it, constitutes a key asset and a comparative advantage for China's artificial intelligence - AI in the global market (*Ibidem*).

Figure 2.27 China's AI forecast spending (2021-2026)

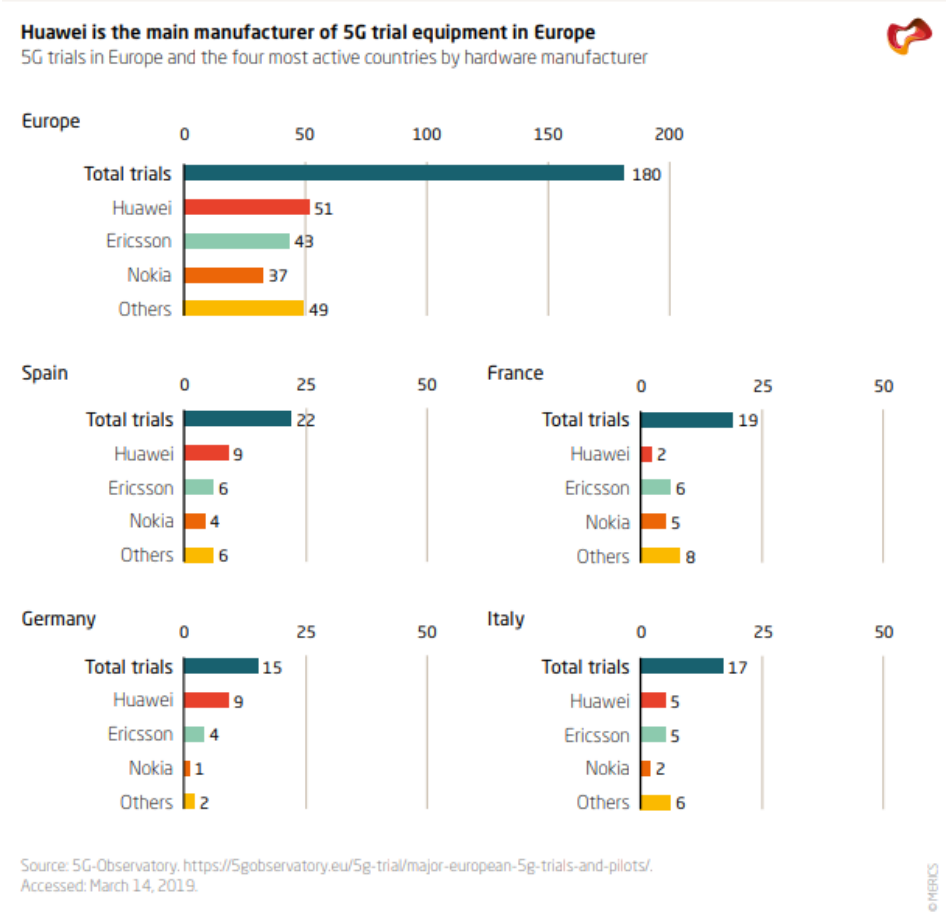


Source: IDC, 2023, https://www.idc.com/getdoc.jsp?containerId=prCHC50557923, accessed on 29/04/23

AI is a very complex line of research in which significant progress has recently been made. Indeed, with the technological revolution introduced by digital network technologies, the capacity and speed of computing have increased exponentially, in parallel with the miniaturization of computing devices and the decrease in their cost. To give an example, smartphones on the market today have impressive computing power compared to the machines of the last century. The widespread diffusion of miniaturized networked digital computing devices has made possible the massive online conversion of social and economic activities, through platforms and applications capable of collecting, processing, and

generating digital data in quantities and at speeds unthinkable in the days when the potential of AI was merely intuited. AI feeds on data, software, and powerful computers capable of machine learning, which in practice consists of the ability to recognize patterns from masses of data in order to proceed to identifications, simulations, comparisons, predictions, and any computational operation useful for specific purposes. For instance, the experimentation of self-driving vehicles requires the simulation of countless scenarios, for which huge amounts of data collected from real life must be used. In the case of AI used for facial recognition, which is currently the most widespread application, it is clear that the effectiveness of the results depends on the size of the data pool to draw on. But a very important aspect of AI is that it requires a great deal of human labor for so-called data-labelling, which serves to classify the data collected by machines in order to make it machine-readable. This is present in great abundance in China, which has three of the seven giants in the artificial intelligence sector (BAT). Much progress has also been made in AI microprocessors in China. Alibaba, for example, released in September 2019 an AI-machine-learning chip with a much higher performance than those produced by Nvidia, a leading American company. These resources give China a comparative advantage in the global AI market. However, China is not autonomous in the industrial production of the chips, reason for which it has to import them from Taiwan and the US. The aforementioned MiC2025 program aims to catch up with this. In this effort to develop a domestic AI-based industry to re-launch it on the global market, China has focused on Smart Manufacturing, which is gradually emerging with a central role in the transformation of Industry 4.0. Industrial AI functions as a systematic methodology that provides solutions for and links academic research with business interests. In the current industrial landscape, the integration of artificial intelligence with recent technologies such as industrial internet of things, big data analytics and cloud computing will be the key to achieving flexible, efficient, and environmentally friendly industrial development. Among the main purposes of Smart Manufacturing systems is the optimization of workforce, materials, and energy resources in order to respond quickly to market changes; these results can be achieved by significantly increasing the level of automation in factories, whose importance will be vital for companies' production decisions (*Ibidem*).

Figure 2.28 Huawei is the main manufacturer of 5G trial equipment in Europe



Source: Shi-Kupfer K., Ohlberg M., 2019, p.14, https://merics.org/en/report/chinas-digital-rise

Currently, the standardization of 5G technology and the next generation (6G) is a topic characterized by severe international disputes, but the perspective in which they are presented is no longer that of indigenous innovation. In this sense, China nowadays stands as a leader in the global market and on the technological frontier. In 2018, before the US ban forced Huawei into a major reorganization of its supply chain in order to continue selling its smartphones on a global scale, the Chinese company overtook Apple for the first time as the world's second largest smartphone manufacturer, after Samsung, in terms of volumes distributed. Huawei, however, is not just a smartphone-maker, but is a big player in network technologies and infrastructures, in which it invests massively in R&D in order to develop intent-driven networks or premium broadband, i.e. networks that are not only ultra-fast and ultra-broadband, but also intelligent and flexible, capable of adapting to innovative services of various kinds, such as telecommunications, automotive, smart manufacturing, cybersecurity. In this kind of specialization (using AI into network ICT technologies), Huawei is at the forefront, mainly because it was the first to focus on this segment and currently has the largest

package of 5G patents. It is worth mentioning that Huawei employs around 194,000 people, half of which are employed in R&D with a creative exploratory mission and a strong sense of future-oriented community and has a portfolio of around 90,000 patents. The trade war launched by the US against China reveals the American perception of China as a threat in the most advanced high-tech sectors included in the MiC2025 program, e.g., the Chinese leadership in 5G technologies. In this sector, dominated by 6 companies (Huawei, Samsung, LG, Nokia, Ericsson, and Qualcomm) only the last one is American and the first three are Asian. The attempt to ban Huawei from the US market, to which was also added the prohibition of international companies to sell products made with US software, components, or machinery to Huawei, has severely affected its supply chain, especially with regard to chips and semiconductor materials. This scenario has equally affected the US, which widely uses embedded 5G technologies as standard-essential in 3G, 4G, 5G mobile networks and pays Huawei, directly or indirectly to its technology vendors, the corresponding royalties. It is interesting to note that, in the case of 5G standardization, the parties are reversed between China and the US compared to previous TD-SCDMA and WAPI technologies. In fact, China is actively participating in the 3GPP - 3rd Generation Partnership Project international forum in charge of defining the technical specifications of 5G, while the US is lagging behind and unable to lead this standardization process. In order not to be left out, the US took a momentary step back and proposed to collaborate with Huawei on the definition of 5G. However, the situation and future developments are uncertain: the possibility of a new US ban on Huawei and ZTE has recently resurfaced (2023). In the meantime, China is accelerating in the direction of consolidating its technology leadership in other strategic areas, such as cloud computing, blockchain, virtual and augmented reality. In addition, the China Standards 2035 plan was promulgated in 2021, outlining the global standards of the next generation (*Ibidem*).

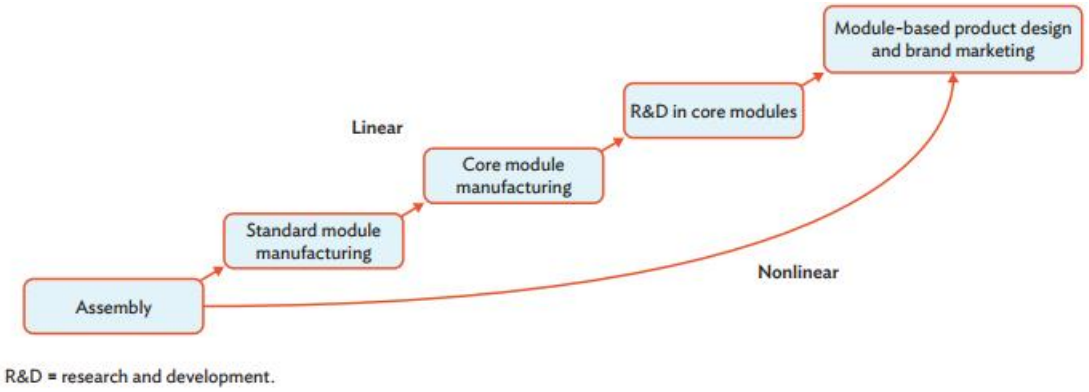
2.5.2. The rise of national champions

This section focuses in more detail on two main topics: the rise of national champions in the consumer electronics ICT sector (smartphones) and e-commerce sector in China (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; Fariselli P., 2020).

As for the first topic of this section, there are generally two paths firms can take to upgrade along Global Value Chains (GVCs): linear and nonlinear. Linear upgrading involves step-by-step progress from low to high value-added tasks, such as starting with assembling mobile phones and then manufacturing increasingly complex components until producing

one's own brand of mobile phones. On the other hand, a nonlinear path involves sourcing core technologies from international suppliers or acquiring firms that own those technologies and then concentrating on noncore technology activities, such as assembly and brand building, to take advantage of the international division of labor along GVCs. These paths are illustrated in the provided Figure 2.29 (*Ibidem*).

Figure 2.29 Linear and Nonlinear Upgrading paths along GVCs



Source: ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.94

The phenomenal success of the Chinese smartphone industry is an exemplary illustration of nonlinear upgrading within GVCs. In the global smartphone market, domestic Chinese brands such as Huawei, OPPO, and Xiaomi have emerged as some of the top global smartphone brands. These Chinese firms entered the industry by sourcing core technological components from foreign multinational corporations (MNCs) while simultaneously focusing on incremental innovations, marketing, and brand building. By leveraging the modularization of smartphone production and standard mobile platforms, these firms successfully challenged the monopoly of established MNCs from advanced economies in both domestic and international markets, thereby eroding their market share. This success was made possible by overcoming the initial technology and marketing gap[72] and utilizing their knowledge of the domestic market to gain a competitive advantage before gradually expanding their presence in foreign markets (*Ibidem*).

Table 2.3 illustrates the dependence of PRC smartphones on foreign technology platforms. The table displays the operating systems and core components utilized by the Huawei P30 Pro, OPPO R11s, and Xiaomi Mi MIX 2 smartphones, all of which were

[72] When firms from developing economies attempt to enter international markets, especially in newly emerged high-tech markets, they typically encounter two challenges: a technology gap and a marketing gap. The technology gap arises due to weak technology and innovation capabilities, making it difficult to access necessary technologies. On the other hand, the marketing gap is characterized by high barriers to entry into concentrated global markets and includes heavy information costs and investments required to establish a brand (*Ibidem*).

launched after 2018. The data reveals that foreign value added constitutes a significant proportion of the manufacturing cost of these smartphones. Specifically, foreign value added represents 84.5% of the manufacturing cost of the Xiaomi Mi MIX2, 83.3% of the OPPO R11s, and 61.9% of the Huawei P30 Pro (*Ibidem*).

Table 2.3 Dependence of Huawei, OPPO, Xiaomi smartphone on foreign technology

Table 3.2 Dependence of Huawei, OPPO, and Xiaomi Smartphones on Foreign Technology			
Core component	Huawei P30 Pro	OPPO R11s	Xiaomi Mi MIX 2
Operating system	Android (USA)	Android (USA)	Android (USA)
CPU	HiSilicon (PRC)	Qualcomm (USA)	Qualcomm (USA)
Flash memory	Samsung (KOR)	Samsung (KOR)	Hynix (KOR)
DRAM	Micron Technology (USA)	Samsung (KOR)	Samsung (KOR)
Display	BOE Technology (PRC)	Samsung (KOR)	JDI (JPN)

CPU = central processing unit, DRAM = dynamic random-access memory, JPN = Japan, KOR = Republic of Korea, PRC = People's Republic of China, USA = United States.

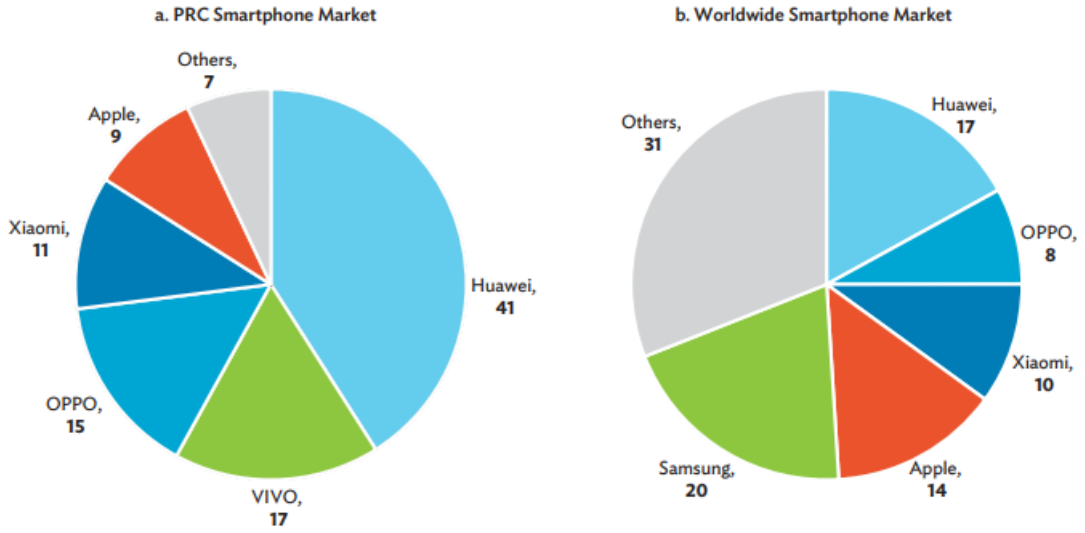
Source: ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.95

PRC smartphone makers have leveraged their knowledge of Chinese consumers' preferences to gain a competitive advantage while focusing on marketing and product differentiation[73].

The nonlinear upgrading strategy adopted by PRC smartphone makers has been successful in overturning the dominance of foreign brands in Chinese domestic market. Indeed, panel a in Figure 2.30 shows that, in the first quarter of 2020, PRC brands accounted for over 90% of the PRC's smartphone market, a significant increase from 10.4% in 2000. Local brands such as Huawei, OPPO, Vivo Mobile, and Xiaomi, which are the top four brands in terms of shipments, hold an 84% market share. Meanwhile, Apple only holds a modest 9% market share, and Samsung, the largest mobile phone maker in the world, has almost disappeared from the PRC market (*Ibidem*).

[73] OPPO has differentiated itself from competitors by positioning its smartphone as having the best camera capabilities in its marketing campaign (*Ibidem*).

Figure 2.30 Share of smartphone market by brand (Q1 2020) (%)



Source: ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.96

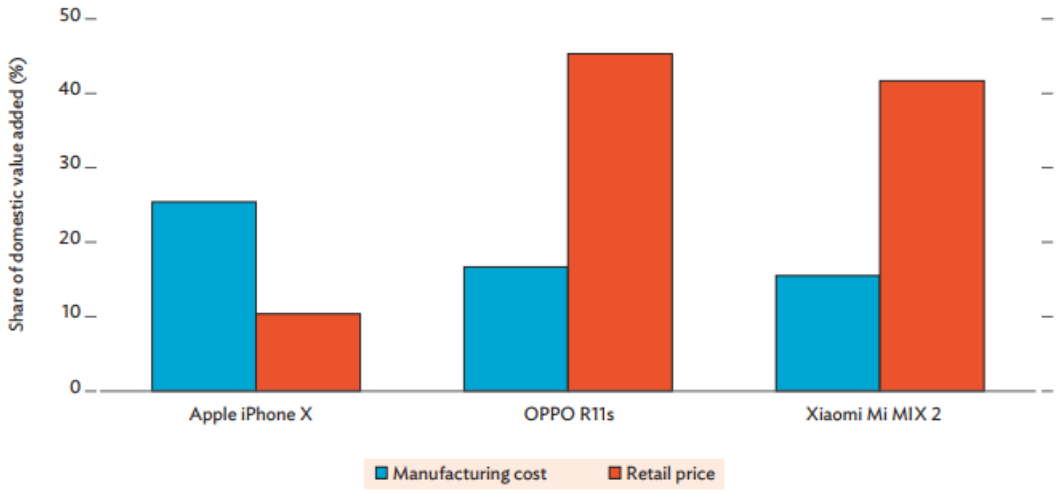
In addition, PRC-based smartphone manufacturers, riding on their success in the domestic market, have expanded their sales globally. They have witnessed their market shares and presence in various foreign markets grow, especially in emerging markets, where affordable PRC-branded smartphones continue to be popular among low- and middle-income consumers. For instance, in India's smartphone market, PRC brands accounted for 66% of the market share in the first quarter of 2019. In this market, Xiaomi overtook Samsung to become the biggest brand (*Ibidem*).

As of the first quarter of 2020, Huawei, OPPO, and Xiaomi held three out of the top five positions in terms of global smartphone shipments, as depicted in the Panel b in Figure 2.30.

As noted earlier in this dissertation, the distribution of value creation is uneven across the different stages of the value chain, and intangibles such as brands contribute significantly to the value-added. However, firms that lack technological capabilities can still increase their value added in high-tech products by adopting a nonlinear upgrading strategy. Indeed, in Figure 2.31, the value-added accruing to the PRC for the Apple iPhone X, the OPPO R11s, and the Xiaomi Mi MIX 2 is compared. While all three smartphones are assembled in the PRC, only Oppo and Xiaomi are local brands, while Apple is a US brand. When value added is measured based on manufacturing cost, the share accruing to the PRC is 25.4% for the Apple iPhone X and less than 20.0% for both the OPPO R11s and the Xiaomi Mi MIX 2. However, when retail price is used as a proxy for the whole value added of a good, the domestic value added of the OPPO R11s is 45.3% and 41.7% for the Xiaomi Mi MIX 2,

much higher than that of the Apple iPhone X, which is at 10.4%. This suggests that brand ownership plays a significant role in increasing domestic value added for PRC smartphones (*Ibidem*).

Figure 2.31 Domestic value added of Apple iPhone X, OPPO R11S and Xiaomi Mi MIX 2



Source: ADB, UIBE, WTO, IDE-JETRO, DERF, 2021, p.97

The effectiveness of a nonlinear upgrading strategy heavily depends on the absence of political interference in international trade, thus allowing companies to acquire parts and core technologies without being discriminated based on their nationality. In that sense, geopolitical tensions and trade frictions can disrupt the smooth functioning of firms that rely on a nonlinear upgrading strategy. The experience of Huawei serves as an example of the hazards involved in pursuing a nonlinear upgrading strategy in a high-tech industry. As previously mentioned, in 2018, Huawei, a multinational technology company based in the People's Republic of China (PRC), lost its position as the world's second-largest smartphone brand when the US Government imposed strict export controls and market access restrictions on Huawei for national security reasons, forcing the company to diversify its global business model. Huawei has now become a leader in digital technology procurement for the tech industry and in AI and 5G tech integration. Huawei's rise and fall in the global mobile phone market reveals not only the excessive dependence of the most innovative high-tech company in the PRC on foreign technologies but also the risks of pursuing a nonlinear upgrading strategy within the GVC system (*Ibidem*). To conclude, the extent to which Chinese domestic brands will be able to move further up the Global Value Chain of the Information and

Communication Technology sector, abandoning their subaltern role (modularity trap[74]), needs further study and analysis (Sun Y., Grimes S., 2015/2016).

As for the second topic of this section, in Western countries the spread of the Internet came at a time in their history when these economies had already experienced a century of expansion and growth, and companies and offline shops had already built up and intensified extensive commercial infrastructure networks over time. When e-commerce appeared, it was perceived as an additional tool allowing them to expand further, nationally or internationally. The same obviously cannot be said for more backward economies where the very lack of infrastructure and physical outlets is one of the biggest obstacles to their growth. However, by taking place in a non-place (the web) e-commerce is independent of the presence of infrastructure and can reach potentially anywhere. Chinese e-commerce has thus managed to draw strength from many of the country's weaknesses, finding effective and innovative solutions. Today, it is a driving force of the economy and has contributed decisively to the creation of an efficient service sector. In addition, it is very important to note that one of the determining factors in the success of e-commerce is that it has flourished almost autonomously from the initiatives of individuals, in contrast to the centralized policy of the Party, building a sustainable growth model. At this point, it is necessary to proceed with a brief review of the major players in the Chinese e-commerce landscape (ADB, UIBE, WTO, IDE-JETRO, DERF, 2021; Fariselli P., 2020).

Jack Ma serves small and medium-sized Chinese manufacturers with his B2B platform Alibaba.com. Alongside Taobao in 2008 came Tmall (天猫), Alibaba's B2C platform that targets large international brands and allows them to sell in the Chinese market against commission on transactions. Tmall, with its focus on brands, product authenticity and a shopping experience that reminds of a shopping mall visit, has gained a dominant position in the Chinese e-commerce landscape and is responsible for more than 60 per cent of all B2C[75] purchases. In 2014, Alibaba launched Tmall Global, its cross-border e-commerce platform. This model simplifies things for international companies by allowing them to reach Chinese consumers without necessarily having a legal entity in China. Today, Tmall Global serves

[74] ‘‘[…] When a firm fails to align its organizational structure with its technological structure, an organizational trap occurs as a consequence to that misalignment. The modularity trap is defined as a kind of organizational misalignments that occurs when a decentralized firm fails to shift to a centralized one when the technology of its product shifts from a modular to an integral phase. In other words, if a firm remains decentralized when the technology shifts to an integral phase and finds it difficult to see through the interdependencies in the new integral product that has emerged in the market then we talk about modularity trap’’ (Bouamama, Shibata, 2017, p.3).

[75] Analysis China, http://www.analysyschina.com/view/viewDetail-254.html, accessed on 29/04/23.

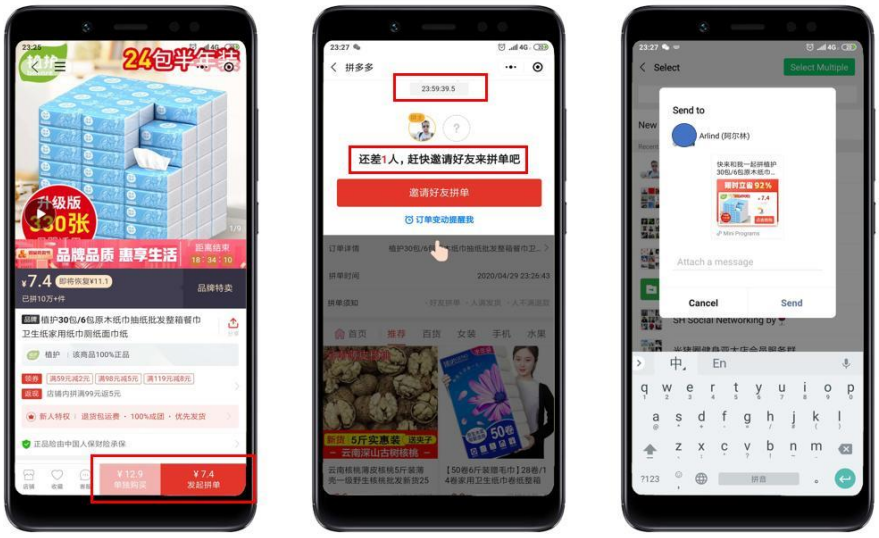
more than 20,000 companies from over 77 countries and regions around the world[76] (*Ibidem*).

Beijing-based JD.com is Alibaba's biggest competitor in e-commerce. Its business model makes it comparable to Amazon; it has an extensive warehouse network and an efficient logistics service. It focuses on customer satisfaction while offering the most comfortable experience possible, guaranteeing excellent timing and an efficient and reliable after-sales service. Due to its reputation, JD is also able to accommodate many international brands. In order to expand their respective market shares and fight the dominance of Alibaba in online sales, JD.com entered into a strategic agreement with Tencent in 2014. Tencent acquired 15 per cent of JD.com's shares. In doing so, Tencent effectively entered the e-commerce sector, investing in the country's most important emerging platform. On the other hand, JD.com gained Tencent's very large user base, becoming WeChat's default e-commerce site. JD and Tmall concentrate more than 80 per cent of B2C purchases in China (*Ibidem*).

PinDuoDuo, is the rising star of Chinese e-commerce. It was launched in 2016 and has since experienced the fastest growth ever recorded in China. The platform directly connects manufacturers with consumers, cutting out the middlemen and acquisition costs. In addition, PinDuoDuo uses the group buying commercial model. Two prices are indicated for each item. The first is the standard price for direct purchase, while the second is the price that would be accessed through a group purchase, i.e., by convincing a number of friends (by sharing a link on WeChat) to make the same purchase within 24 hours or by joining another group of people (*Ibidem*).

[76] Reuters, https://www.reuters.com/article/us-alibaba-china/chinas-alibaba-aims-to-double-tmall-globalbrands-with-english-portal-idUSKCN1TR0Z8, accessed on 29/04/23.

Figure 2.32 PinDuoDuo group buying



In basso i due prezzi, il primo standard, il secondo per un acquisto di gruppo

Dopo aver effettuato il pagamento, PinDuoDuo mostra il numero di persone necessarie per concludere l'acquisto di gruppo, il tempo rimasto ed invita a condividere l'offerta con un contatto o gruppo su WeChat

Source: Fariselli P., 2020, p.304

With this model, PinDuoDuo manages to generate economies of scale and offer the lowest prices on the market. In 2019, after only 4 years, the capitalization of the company exceeded USD 40 billion with 366 million monthly active users[77], knocking JD.com out of second place in terms of volume of goods sold[78]. Lastly, PinDuoDuo's strong social dimension, due to its strong integration with WeChat, gives the emerging platform a competitive advantage in direct comparison with Alibaba, which cannot benefit from a social presence comparable to that of Tencent, which instead extends its roots further into the e-commerce sector through PinDuoDuo (*Ibidem*).

Meituan is a platform that emerged in the restaurant sector, which through a series of mergers and strategic partnerships has been able to greatly expand its range of services. Via Meituan, it is possible to order meals at home (O2O – Online to Offline marketing strategy), read reviews of many restaurants and book tables while taking advantage of exclusive promotions. Customers can book a taxi via the private car transport function or choose to cycle, taking advantage of the bike sharing service. Consumers can even buy cinema tickets or book karaoke rooms. Lastly, Meituan has expanded into the tourism sector, offering the possibility to buy tickets for any means of transport, book hotels or private flats. In June 2019,

[77] Forbes, https://www.forbesmiddleeast.com/industry/business/pinduoduo-1-5b-startup-challenging-e-commerce-giant-alibaba-chinas-towns-villages, accessed on 29/04/23.
[78] Technode, https://technode.com/2019/11/15/pinduoduos-growth-by-the-numbers/, accessed on 29/04/23.

its capitalization reached USD 47 billion[79], knocking out Baidu from the BAT triumvirate that has dominated the Chinese technology landscape for years. In April 2020, the company's capitalization exceeded USD 70 billion[80]. Meituan also has a direct connection from WeChat that generates a lot of data flows (*Ibidem*).

Other companies worth mentioning are Suning, Kaola.com and Vip.com. Suning was founded in 1996 in Nanjing, it is specialized in consumer electronics and, in addition to a developed offline shop network of over 13,000 shops in 700 cities, offers a thriving B2C e-commerce platform. Kaola is the leading cross-border e-commerce platform, and it was founded by NetEase technology group in 2015. In 2019, it was acquired by Alibaba for $2 billion. Vip.com is China's leading flash sales platform. This sales model consists of limited time and limited quantity sales, focusing on user loyalty and communication strategies such as FOMO (fear of missing out), thus urging consumers to purchase.

Furthermore, Chinese market absorbs new technologies at an unprecedented speed and integrates them, generating new sales models and shopping experiences. In this context, new trends are emerging, such as: social commerce; omnichannel commerce; online + offline; new retail (*Ibidem*).

A term that has gained popularity in recent years is the omnichannel marketing strategy: an approach to selling that connects every potential online and offline channel leading to the consumer. This strategy takes full advantage of every stage of the customer journey, aiming to reach the customer on any current or potential platform and touchpoint.

Another very important term in the scenario of new shopping trends in China is certainly social commerce: a new paradigm that merges the e-commerce and social media experience. Given the centrality of the concept of relationship (关系) in Chinese culture, social networks become places where these relationships are multiplied and linked to sales strategies. Social commerce in China makes extensive use of influencers and KOLs (Key Opinion Leaders), people with recognized online popularity and expertise in specific fields such as fashion, cooking, culture, travel, fitness, etc. who are able to influence the purchasing decisions of target consumers. These figures have determined the enormous success of a particular sales model: the live streaming model (live sales on social networks). This tool has already been integrated by the national champions of Chinese e-commerce (Taobao, Tmall, JD, Tencent, PinDuoDuo) (*Ibidem*).

[79] Quartz, https://qz.com/1648807/bat-no-more-meituan-dianping-is-now-worth-more-than-baidu/, accessed on 29/04/23.
[80] Bloomberg, https://www.bloomberg.com/quote/3690:HK, accessed on 29/04/23.

Figure 2.33 Taobao live streaming

Sezione Live Streaming di Taobao | Esempio di vendita in diretta

Source: Fariselli P., 2020, p.309

Another relevant case that underlines the importance of the social commerce ingredient in the omnichannel marketing strategy is represented by Xiaohongshu (小红书) which was established in 2013 as a social network for sharing and discussing the latest trends in fashion and beauty products. The priority for Xiaohongshu is to focus on its community of users (typically women) and cultivate its reputation on beauty products. In 2016, Xiaohongshu opened its first physical shop in Shanghai. Indeed, the traditional offline → online → social paradigm has been turned upside down. The most striking part about this space is how it was designed to be the exact extension of the online platform: its first objective was to be a place for the community to meet, socialize and build loyalty (*Ibidem*).

The fusion of online and offline is therefore inevitable, and continually reshapes and enhances the consumer experience. This is no small responsibility for companies and entrepreneurs in the Chinese market. The buying process is unpredictable, there is no mathematical formula that can pinpoint with certainty either when or through which channel the consumer will buy. The only source of information on potential consumers is data about their electronic transactions and their online behavior. The approach to data and its collection has always been a sensitive issue. Initially, data was seen as a scarce resource and difficult to acquire. Now, this view is reversed, data is flowing and arriving in waves from every channel. In this sense, China's technology giants have embarked on horizontal growth, becoming true ecosystems. This growth process is directly proportional to the amount of information

collected on consumers, and the understanding and fulfilment of their expectations. Proper data analysis enables these national champions to optimize their processes and the accessibility to their services. While initially the digital sales model focused on the final stages of the production process, i.e., those closest to the consumer, there has now been a shift towards digitizing the entire value chain. This change defines the shift to New Retail, i.e., a model that aims at profit maximization through the massive digitization of the entire value chain, innovating and optimizing it. In its initial phase, New Retail focused on increasing traffic in physical shops, optimizing sourcing and maximizing customer conversion rate. Projecting this process into the near future, one can imagine how the value chain will be speeded up and will travel in the opposite direction. In other words, value creation will start from the feedback collected from the consumer in the form of data, and it will be up to production and logistical processes to adapt, thus completely redefining the way people buy and sell (*Ibidem*).

2.5.3. Integration of China's trade in services into Digital Global Value Chain

The advent of new-generation information technologies such as big data, cloud computing and artificial intelligence in the third and fourth industrial revolutions has facilitated the integration of digital products into the Global Value Chain (GVC). This has led to changes in the cost of participation, production and interaction models, and international trade has started to take the form of Digital Global Value Chain (DVC)[81], shifting from the previous GVC. Digital technologies are accelerating trade, enlarging its scale and scope, and driving the digitalization of trade in services. As a vital component of digital trade, digital trade in services is emerging as a new engine for high-quality economic development and a crucial competitive factor in global trade. Its progress provides a critical means for countries to enhance their position in the Digital Global Value Chain (Brookings; Lv Y., Fang R. & Wang D., 2021; iResearch Global Group, 2022; World Bank, 2020).

China's digital economy — the data and key digital technologies — largely relies on digital services such as cloud computing, blockchain, AI, and data analytics, which enable the

[81] The application of digital technologies in Global Value Chains and their expansion in the era of digital trade form the basis of the Digital Global Value Chain trade discussed in this analysis. "This paper defines the Digital Global Value Chain as follows: in the age of digital economy, data participates in the international production specialization as a key factor of production and creates value in trade; as digital technologies keep penetrating and being integrated into traditional trade, the digitalization of modes and objects of trade has sped up and the share of digital products and digital services in the international trade has been increasingly increased, promoting the Global Value Chain to develop into a new Digital Global Value Chain" (Lv Y., Fang R. & Wang D., 2021, p.45).

management of supply chains, facilitate digital payments, and provide better business insights. These digital services also support the online delivery of professional services, retail, education, and healthcare. Various national organizations and scholars have conducted initial studies on measuring the digital economy and digital trade to understand how to account for digital trade in services. However, digital trade in services – as an emerging form of trade - has resulted in new trade practices and regulations that require the establishment of a statistical accounting system which has not been defined yet. Moreover, there is a lack of a common definition of digital trade in services based on current practices. Additionally, it is hard to accurately classify newly emerging products and services in trade statistics, and there is a gap in internationally comparable quantitative measurements for digital trade in services (*Ibidem*).

Against this background, this section refers to Lv, Fang & Wang's analysis (2021) to measure the characteristics of China's digital trade in services through econometric calculations[82] and reveal insights into the digitalization of trade in services. A Digital Global Value Chain is thus constructed and thoroughly examined to provide insights into China's data economy landscape during the sample period of 2000-2014. The analysis comes to the following conclusions:

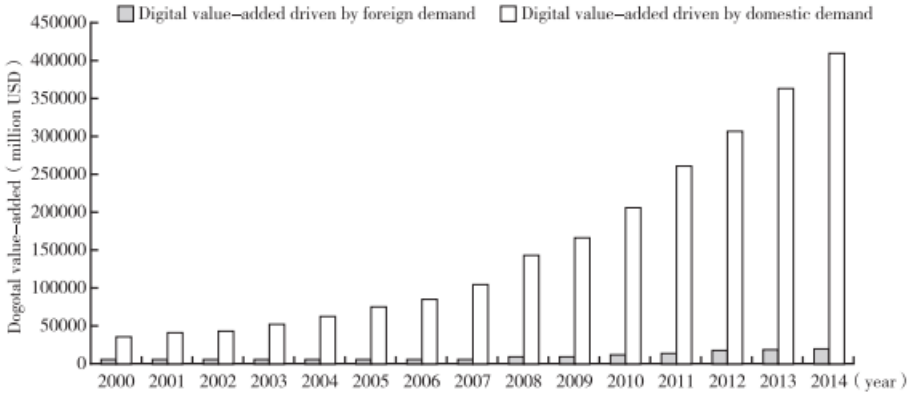
(1) China has experienced significant growth in its digital value-added, driven by both domestic and foreign demand. The digital value-added of Chinese services driven by domestic demand has been consistently higher than that driven by foreign demand. This is illustrated in Figure 2.34 which presents the changes in digital value-added of Chinese services driven by domestic and foreign demand from 2000 to 2014. The data shows that the digital value-added of Chinese services catering to domestic demand has been on a steady upward trend, increasing from USD 34879.79 million in 2000 to USD 409323.71 million in 2014.

The digitalization of the Chinese economy has had a significant impact on both domestic and foreign demand for digital services. Specifically, the rise of digital service demand within the domestic market has stimulated supply-side digitalization, resulting in a more efficient matching of supply and demand. In addition, technical cost reductions have contributed to improved digital service quality and efficiency. Although digital value-added driven by foreign demand has grown steadily, it remains lower than that driven by domestic

[82] This paper "[…] analyzes the multi-dimensional positioning and paths of China participating in the DVC and the characteristics of bilateral connection between China and other main economies in the DVC. The analysis is conducted at three levels, namely path decomposition investigated from domestic and foreign demand and production activities in various forms, two-way digital connection investigated from degree and position of participation, and bilateral connection investigated from composition of countries and mutual dependence" (Lv Y., Fang R. & Wang D., 2021, p.46).

demand. This may be due to China's emphasis on promoting high-quality manufacturing development and integrating it with productive services and the digital economy. Such efforts have contributed to an increase in domestic demand for digital services and modern digital trade in services.

Figure 2.34 Digital value-added of Chinese services driven by domestic and foreign demand



Source: Lv Y., Fang R. & Wang D., 2021, p.54

(2) To better understand China's position in the Digital Value Chain (DVC), Lv, Fang & Wang's analysis (2021) examines ten [83] representative global economies and their engagement in digital trade in services with China. The analysis reveals that both developed and developing economies largely engage in simple participation in digital trade with China. Given that these economies are key participants and decision-makers in digital trade in services negotiations, analyzing the digital value-added of Chinese trade in services resulting from their engagement in the DVC can provide valuable insights. The digital value-added of Chinese services driven by different production activities is presented in Table 2.4 for easy reference.

[83] "The United States, Japan, Germany, Britain, France and Canada are developed economies, mostly G7 members, and distributed in three continents; Brazil, South Korea, Russia and India are developing economies, mostly BRICS countries, and from three continents […]" (Lv Y., Fang R. & Wang D., 2021, p.54).

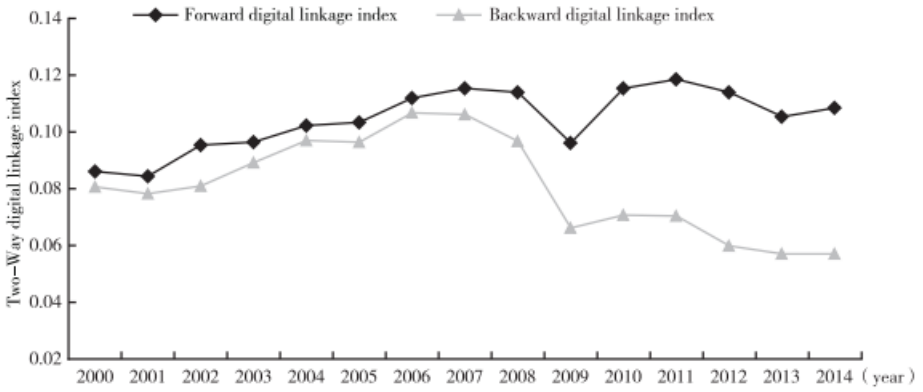
Table 2.4 Digital value-added of Chinese services driven by different production activities (million USD)

Activity type	Year	Developed economy						Developing economy			
		United States	Germany	Japan	France	Britain	Canada	Brazil	South Korea	Russia	India
Simple production	2000	232.10	114.01	137.26	51.74	60.89	21.55	4.72	37.32	2.21	5.33
	2002	299.25	110.40	169.74	50.00	71.03	31.51	5.27	49.68	3.99	9.12
	2004	421.15	179.94	249.79	101.84	110.09	59.42	11.81	71.33	8.28	15.18
	2006	622.76	249.22	279.09	127.59	157.58	90.23	20.70	147.47	23.94	24.31
	2008	949.23	406.86	362.83	188.56	254.46	149.36	48.50	252.33	57.97	44.38
	2010	1170.32	565.09	424.37	344.24	345.43	208.86	81.65	298.75	79.60	58.65
	2012	1546.59	623.74	596.09	323.91	405.46	298.96	125.29	399.72	159.71	83.71
	2014	2290.97	826.03	641.20	443.47	429.00	396.31	173.09	515.50	210.48	135.50
Complex production	2000	99.68	21.31	39.40	16.77	32.89	11.93	6.08	9.34	2.75	4.66
	2002	134.75	26.44	52.04	22.12	45.61	15.57	6.36	14.50	4.93	7.30
	2004	196.52	45.38	80.16	39.92	77.86	28.66	8.89	21.48	7.25	11.31
	2006	316.95	66.65	121.00	59.69	105.89	51.59	17.63	42.01	16.65	22.13
	2008	520.27	122.32	200.99	102.55	175.46	79.64	41.78	75.46	33.67	40.91
	2010	638.36	172.60	229.78	163.73	228.69	102.17	66.22	93.45	35.62	64.12
	2012	907.13	220.35	380.68	217.56	314.76	156.40	112.60	149.86	69.39	92.53
	2014	1216.55	298.58	366.93	266.94	362.23	181.40	128.67	181.17	92.98	103.12

Source: Lv Y., Fang R. & Wang D., 2021, p.55

(3) According to Lv, Fang & Wang's analysis (2021) of China's characteristics and position in the Digital Global Value Chain, Chinese services are primarily integrated into the DVC through forward participation and specialize in providing digital services to other economies. Furthermore, a dynamic analysis of the period 2000-2014 reveals that the forward and backward digital linkage indices of Chinese services have evolved in an M-shaped trend. Over time, Chinese services have shifted from digital value input to becoming a digital value output in the DVC.

Figure 2.35 Participation of Chinese services in the DVC



Source: Lv Y., Fang R. & Wang D., 2021, p.56

Figure 2.35 shows the abovementioned M-shape trend. "During 2000−2007, along with China's accession into WTO, Chinese services participated in the DVC specialization at

an increasingly deeper level […]; in 2008−2011, under the impact of the European debt crisis and the financial crisis, both forward and backward digital linkage index declined temporarily and then slowly rebounded slightly", showing that "the DVC specialization and cooperation of Chinese services were obstructed to different degrees, but managed to deepen slightly after the impact faded off"; "In 2012-2014, as affected by both external factors such as weak global economic recovery and rising trade protectionism and internal factors such as increased labor cost and fiercer environmental pressure, China's participation in the DVC specialization and cooperation was severely tied up and processing trade import/export evidently declined", with backward digital linkages slightly declined in 2014. On the contrary, forward digital linkages "climbed up by a small margin in 2014, which was possibly related with the policies on promoting the digital transformation and upgrade of trade in services put into effect in China. This diverging trend between" backward and forward digital linkage indices "revealed the ongoing changing process of the role of Chinese services in the DVC from digital value input to digital value output" (Lv Y., Fang R. & Wang D., 2021, p.56).

(4) In addition, Table 2.5 and Table 2.6 provide an international comparison of the size of digital trade in services among major countries in 2000 and 2014, as well as their position in the DVC.

Table 2.5 Total value-added of digital trade in services in main economies worldwide (million USD)

Developed economy	2000	2014	Developing economy	2000	2014
United States	915087.80	1522096.00	China	58620.20	733554.60
Japan	342401.10	299040.70	Brazil	44697.62	167078.80
Germany	147682.10	284860.60	Switzerland	35210.05	89943.38
Britain	140849.10	256665.60	Russia	10445.89	77722.87
France	112374.60	246948.50	India	11616.11	57083.14
Italy	88803.98	151031.10	Mexico	23444.09	46700.40
Australia	41767.42	150447.30	Indonesia	7704.07	40554.82
Canada	49486.01	114039.90	Poland	13253.97	33014.79
Netherlands	39801.34	91805.76	Norway	11154.15	33003.09
South Korea	36997.33	91248.49	Turkey	14129.98	29334.61
Spain	35560.64	84666.55	Denmark	10917.31	28002.70
Belgium	21251.27	55945.95	Greece	8816.94	13706.35
Sweden	16894.92	38789.47	Romania	1957.55	12289.91
Taiwan, China	23985.16	32272.10	Hungary	3321.08	8716.29
Austria	14110.12	31041.22	Slovak Republic	1597.63	7511.77
Ireland	9622.34	23969.32	Bulgaria	688.68	3681.10
Finland	7974.04	18545.16	Croatia	1181.91	3270.40
Portugal	9764.18	16846.29	Slovenia	1139.95	3188.80
Czech Republic	4510.18	16299.77	Latvia	623.53	2303.42
Luxembourg	2181.74	7757.34	Lithuania	572.99	2114.51
Cyprus	660.88	1750.26	Republic of Malta	356.63	1653.02
—	—	—	Estonia	391.39	1628.73

Note: Developed and developing economies are classified with reference to the UNCTAD standard and rank in a descending order by total value-added of digital trade in services in 2014.

Source: Lv Y., Fang R. & Wang D., 2021, p.59

Table 2.6 International comparison on the participation position in the DVC

Higher	Upper-medium	Lower-medium	Lower
United States	France	Russia	Mexico
Germany	Britain	Spain	Bulgaria
Japan	Sweden	Czech Republic	Greece
Belgium	South Korea	Portugal	Lithuania
Netherlands	Taiwan, China	Estonia	Croatia
Denmark	Australia	Cyprus	Indonesia
Switzerland	China	India	Latvia
Finland	Italy	Slovenia	Turkey
Norway	Canada	Poland	Slovak Republic
Luxembourg	Ireland	Brazil	Romania
Austria	Republic of Malta	Hungary	—

Source: Lv Y., Fang R. & Wang D., 2021, p.59

In particular, Table 2.5 reports the total trade value during the period of 2000-2014. The data shows that the total digital value-added of trade in services among developed economies, such as the United States, Japan, and Germany, was higher than that of developing economies. This disparity can be attributed to several factors. Developed economies have well-established services sectors, a large number of service multinationals, and robust digital economy policies, which have facilitated the continuous growth of their digital trade in services. In contrast, developing economies, such as China, have been hindered by a lack of digital infrastructure and backward communication technologies, which have limited the development of their digital trade in services. However, by 2014, China had become the second largest player in digital trade in services among the sample countries. Despite its late start, the Chinese government has implemented a series of reform measures to promote the development of its new service-based economy and digital infrastructure, resulting in the growth of its digital industrial foundation and enterprises. China has also enhanced its innovation capacity through leapfrog imitation and learning of digital technologies (ICT). Consequently, China has gained comparative advantage in digital trade in services. The dominant players in the DVC, such as the United States, Japan, and Germany, are mostly positioned higher due to their R&D, design, and other high-tech upper-stream services. In contrast, developing economies with lower technological levels, such as Russia and Brazil, are positioned medium or lower. Despite ranking below most economies, China is positioned upper-medium in the DVC due to its high-ranking R&D innovation capacity.

(5) Lastly, Lv, Fang & Wang (2021) show that China has strong bilateral connections with great powers in technology and services, such as the United States, Japan, and European

countries. The study also reveals that over time China has shown a significant decline in its dependence on digital intermediate import from developed nations and has become the main source of digital intermediate import for most countries. Consequently, China has emerged as a critical hub[84] in the DVC.

Table 2.7 Two-way digital dependence between Chinese services and representative economies (%)

Type of dependence	Economy	2000			Economy	2014		
		$SDDVA_{mi}$	$SDDVA_{im}$	$BDDVA_{mi}$		$SDDVA_{mi}$	$SDDVA_{im}$	$BDDVA_{mi}$
Forward digital dependence	United States	17.01	0.41	41.25	Sweden	7.19	2.30	3.12
	Japan	14.46	0.71	20.40	Germany	9.40	3.08	3.06
	Spain	1.07	0.09	12.13	United States	20.21	7.17	2.82
	Britain	6.28	0.57	10.96	Netherlands	10.58	4.00	2.65
	Germany	15.32	1.57	9.75	Switzerland	1.85	0.87	2.13
	Italy	2.25	0.26	8.67	France	8.84	4.47	1.98
	Luxembourg	2.30	0.28	8.20	Japan	3.03	1.54	1.97
	Switzerland	1.59	0.28	5.64	Canada	3.09	1.69	1.83
	Netherlands	5.57	1.28	4.36	Italy	2.88	1.94	1.48
	Canada	2.14	0.59	3.64	Belgium	4.16	3.51	1.19
Backward digital dependence	United States	18.10	0.50	36.20	Sweden	7.34	1.63	4.51
	Luxembourg	2.34	0.10	22.99	United States	20.70	6.32	3.27
	Spain	1.06	0.07	15.71	Netherlands	10.80	4.17	2.59
	Germany	17.13	1.22	14.04	Switzerland	1.74	0.87	1.99
	Britain	5.36	0.45	12.01	France	8.42	4.53	1.86
	Italy	2.20	0.23	9.75	Germany	11.45	6.17	1.85
	Japan	9.13	1.04	8.78	Belgium	4.23	2.82	1.50
	Netherlands	6.58	1.03	6.39	Canada	2.79	1.88	1.48
	Switzerland	1.68	0.27	6.24	Italy	2.74	2.00	1.37
	Sweden	274	0.55	4.97	Britain	1.74	1.68	1.03

Note: Only top ten countries ranked by $BDDVA_{mi}$ are shown in Table 7.

Source: Lv Y., Fang R. & Wang D., 2021, p.62

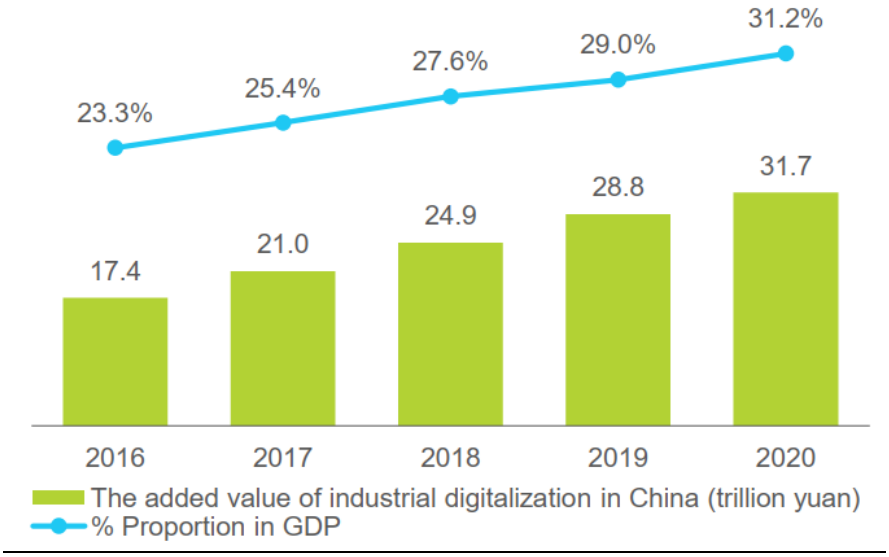
Although the reported analysis illustrates economic data dating back to 2000 – 2014, it is useful to better understand the integration, the positioning, and the characteristics of China's trade in services into the Digital Global Value Chain and China's shifting position from digital input to digital output in this system. However, by looking at the current scenario, more recent studies[85] update previous findings and state that China has established a strong basis for its digital economy and has emerged as a leader in several digital technologies. With the help of its comparative advantage in big data, 5G, artificial intelligence, industrial internet

[84] Based on the findings of backward digital dependence analysis, China exhibited a high level of dependence on European, U.S., and Japanese markets for digital intermediate products in 2000, as its digital innovation capacity was relatively low and processing trade was in the early stages. However, in 2014, China's trade strength in services and improved digital technologies led to a reduction in its dependence on digital intermediate imports from developed economies. Additionally, China became the main source of digital intermediate imports for most economies. This implies that many economies began relying more on digital intermediate products from China, making China a critical player in the DVC (Lv Y., Fang R. & Wang D., 2021).

[85] World Bank, 2020; Taguchi H., and Zhao J., 2022; Wang H. and Miao L., 2022; iResearch Global Group, 2022.

and cloud computing, China has accelerated the development of new business models with data as a key foundation and has prioritized the promotion of services to further extend its role in the higher ends of DVC. Indeed, China is now the largest international trader in the production of goods and the second largest trader in the services sector (advanced manufacturing and services hub), it holds the second largest digital economy in the world and its current digital economy development strategy focuses on accelerating the development of digital industrial chain[86], value chain and data asset ecosystem (at home and abroad) as it will be discussed in the following sections.

Figure 2.36 China's industrial digitalization scale (2016-2020) (%) (trillion yuan)



Source: iResearch Global Group, 2022

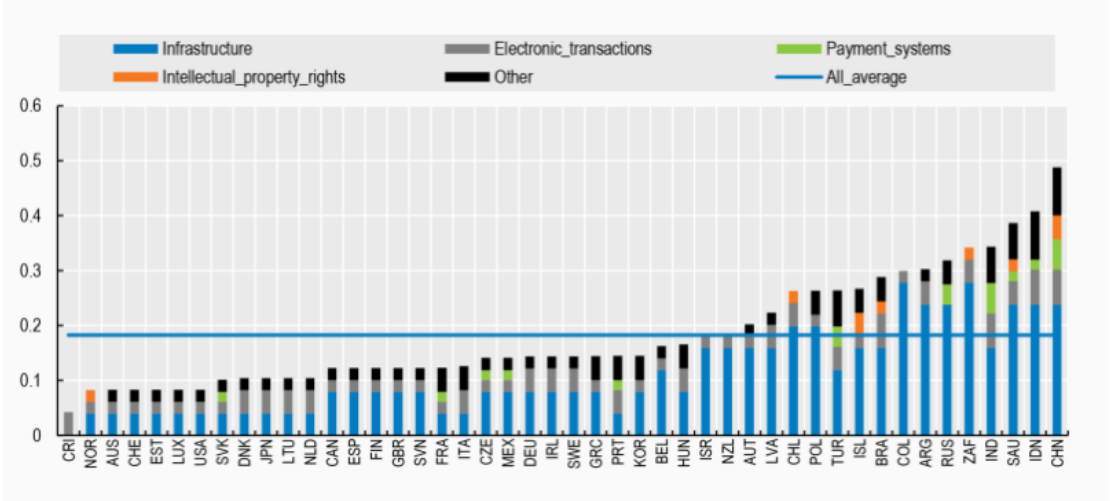
2.5.4. China's data governance and data asset ecosystem

China's approach to governing digital services and data involves a relatively closed domestic market for digital services, coupled with restrictions on cross-border data flows, which includes limitations on access to information. This approach reinforces the development of national champions and prevents foreign competition to access Chinese domestic market. As for China's restricted domestic market for digital services, the OECD digital services trade index in Figure 2.37 illustrates how barriers impact trade in digitally

[86] In China, the focus of digital economy development is on industrial digitalization. In 2020, China's industrial digitalization value added accounted for 80.9% of the digital economy and 31.2% of GDP. Industrial digitization is a powerful driver of the digital economy and involves the comprehensive transformation and upgrading of traditional industries across multiple dimensions and the entire value chain, using new digital technologies and involves the gradual shift from a single-point transformation approach to a coordinated upgrading of industrial clusters (iResearch Global Group, 2022).

enabled services, segmented into five policy categories: infrastructure and connectivity, electronic transactions, payment systems, intellectual property rights, and other barriers. A higher score implies greater restrictions. Among the countries included in the index, China has the most stringent restrictions on digital services across all the metrics. The same applies to telecommunications services (Brookings; Wang H. and Miao L., 2022; Liu J., 2019).

Figure 2.37 China's digital services trade regulation are the most restrictive

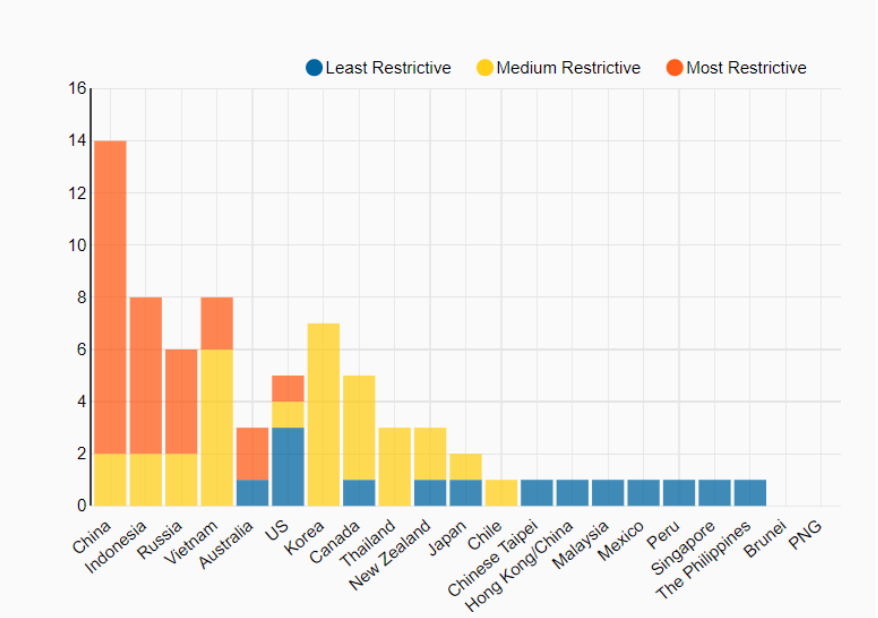


Source: Brookings, https://www.brookings.edu/articles/chinas-digital-services-trade-and-data-governance-how-should-the-united-states-respond/, accessed on 29/04/23

These restrictions are associated with a domestic policy strategy that seeks Chinese dominance in emerging technologies and Chinese self-sufficiency in strategic technological areas, such as advanced information technology, robotics, aircraft, new energy vehicles, and biotechnology. The Made in China 2025 program is a policy initiative that aligns with these goals (*Ibidem*).

As for China's restricted cross-border data flows, China has imposed strict regulations on access and use of data, including data localization requirements and restrictions on the movement of data across borders. This led to further constraints on digital services trade. According to Figure 2.38, China has the highest number of data flow restrictions compared to other Asia-Pacific Economic Cooperation (APEC) member economies. The most restrictive cross-border data flow regulations in China pertain to security, Internet access, control, and financial flows and services under its Cybersecurity Law (*Ibidem*).

Figure 2.38 China has the largest number and most data flow restrictions in APEC



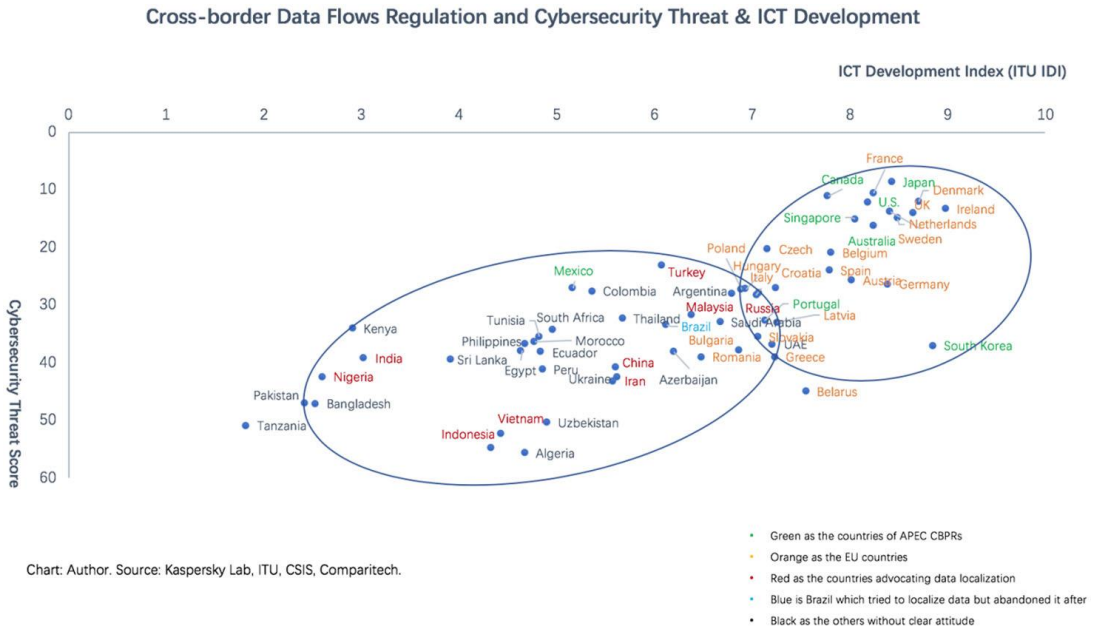
Source: Brookings, https://www.brookings.edu/articles/chinas-digital-services-trade-and-data-governance-how-should-the-united-states-respond/, accessed on 29/04/23

As Figure 2.37 and 2.38 have already shown, China has implemented a comprehensive regulatory framework for cross-border data flows that prioritizes local storage and outbound assessment. Under the guidance of the so-called AI-tech nationalism, this approach is driven by a combination of practical security concerns, economic and industrial benefits, and technological development as main drivers of data localization, a product of Internet sovereignty[87]. This section refers to Liu's analysis (2019) and offers a brief insight on China's data localization strategy in order to better understand China's overall data and internet governance.

The decision to localize the storage of cross-border data flows in China is a strategic response that is influenced by external specific conditions and based on pragmatism.

[87] "Internet sovereignty refers to the splintering or breaking up of the Internet into a system that's governed by each country individually, rather than as a single and uniform experience for all around the world. Also referred to as "cyber sovereignty," according to the Globe Post the term was first used by Chinese authorities in a white paper entitled *The Internet in China.* The white paper stated the principle as follows: "Within Chinese territory, the Internet is under the jurisdiction of Chinese sovereignty. The Internet sovereignty of China should be respected and protected." The underlying concept being illustrated is that China had a right to govern the Internet – and by extension content and the dissemination of this content on the Internet – to comply with the country's distinct laws" (https://www.vyprvpn.com/blog/internet-sovereignty, accessed on 29/04/23).

Figure 2.39 Distribution map of cross-border data flow policy

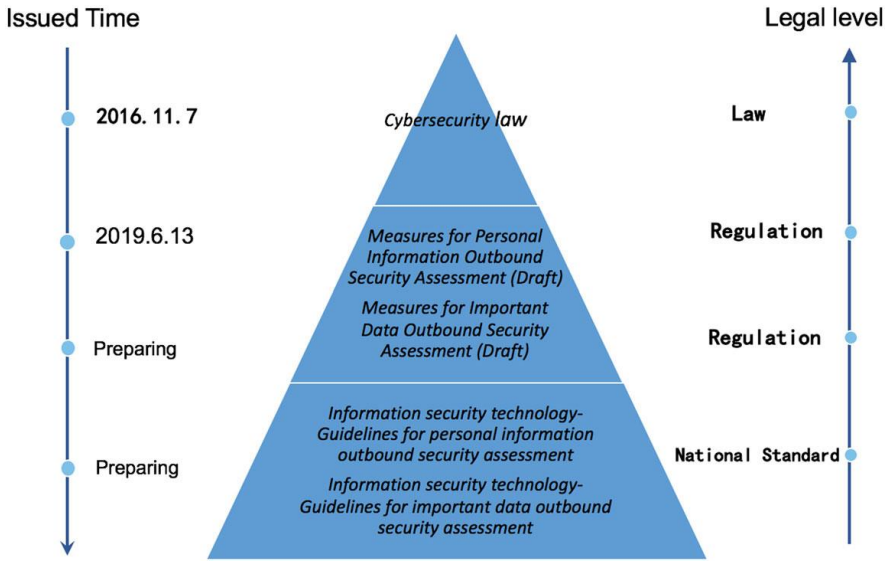


Source: Liu J., 2019, p. 85

The quasi-anarchic nature of the international relation system acts as a backdrop of this strategic and pragmatic decision: "[…] When a country has advanced technology, well-developed industry, and no urgent security threats, then it always adopts a strategy to encourage cross-border data flows. In the opposite situation, it tightens data flows. […] Regarding cross-border data flows", the external environment competition influences the degree of a country's control on the basis of three main factors: technological development, industrial development, and security demand. "The strengths of the three factors affect the relaxation and contraction of strategies. Because it is difficult to quantify these three factors, the ICT (Information and Communication Technology) Development Index (i.e., integrating the technological and industrial development) and the Cybersecurity Threat Score (i.e., feeling insecure) are used as a matrix to indicate the tendency of a country's attitude toward data flows. Although there is not a strict match, the matrix shows the strong relationship between cross-border data flow policy and the three factors". Figure 2.39 "presents two trends in which countries with high ICT development and low cybersecurity threats prefer free data flow; countries with contrasting conditions have negative preferences. Specifically, developed countries, such as Europe and the US, which are shown in the upper-right circle in the figure, encourage data free flow, while emerging developing countries […], are shown in the lower-left circle. There is a higher probability that these countries prefer that data are intercepted inside their borders". China's approach is thus based on the others emerging developing countries' practice (Liu J., 2019, p.85-86).

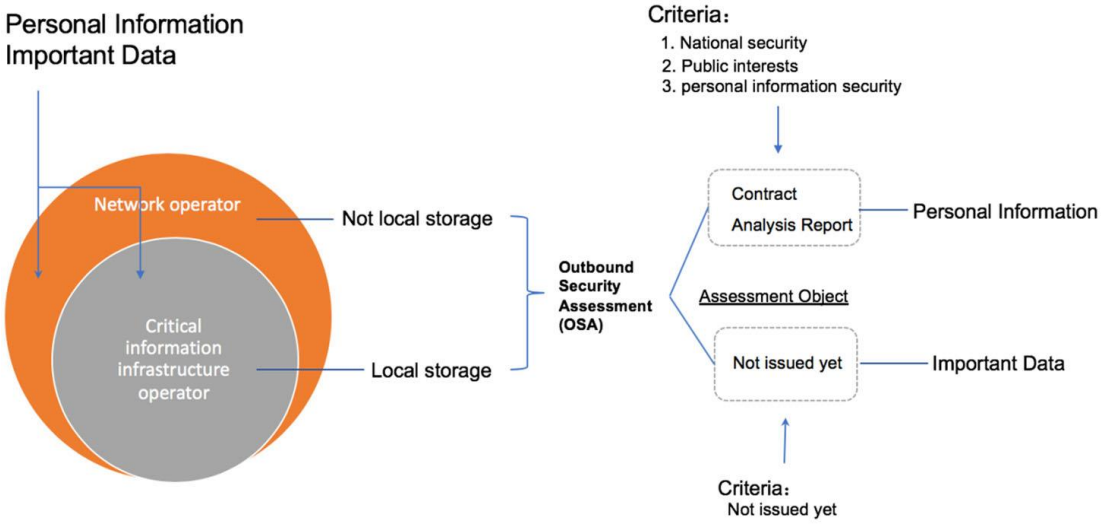
In November 2016, the Cybersecurity Law was passed in China, marking the country's first comprehensive law in the realm of the Internet and a pivotal legal document concerning data localization. It introduced the "local storage and outbound assessment" policy, which stipulates that cross-border data flows must be subject to regulation and protection under the Critical Information Infrastructure (CII). While there was agreement on the fundamental idea of local data storage, the details of the regulatory regime underwent numerous revisions during the drafting process, including changes to the definition and classification of "data" before settling on "personal information" and "important data." The Cyberspace Administration of China (CAC) issued the "Measures for Personal Information and Important Data Outbound Security Assessment (Revised Draft, 2017 May)" to provide additional clarification on the policy. “Personal information refers to various types of electronic information that identify a natural person or reflect the activity of a certain natural person”, while “important data refers to data that are closely related to national security, economic development, and societal and public interests” (Liu J., 2019, p.87-88). China's regulatory regime for cross-border data flows has been developed in a series of rules, as it follows. “In general, China’s regulation requires all network operators to accept the security assessment of personal information and important data collected in China before they can cross the border. In addition, CII operators are also obliged to store these data in China” (Liu J., 2019, p.88). However, despite much uncertainty, the design of the regulatory regime's details continues to evolve. In 2017, the CAC issued the "Measures for Personal Information and Important Data Outbound Security Assessment" for public feedback but abandoned it in 2019 in favor of a new proposal to separate the security assessment of personal information and important data, known as the 2.0 version. Figures 2.40 and 2.41 provide more information on this updated proposal.

Figure 2.40 Legal framework of China's cross-border data flow regulation (2.0 version by June 2019)



Source: Liu J., 2019, p.87

Figure 2.41 Model of China's cross-border data flow regulation (2.0 version by June, 2019)



Source: Liu J., 2019, p.88

Indeed, the issue of regulating cross-border data flows has been the subject of some controversies. There are several key points of contention. Firstly, there is resistance towards the need for strict regulations mandating fully localized storage, with criticism aimed at policies that emphasize restrictive controls on cross-border data flows. Secondly, the idea of classifying data based on the producer, such as personal information, business information, and government information, has been a source of debate. Ultimately, classification criteria for data are based on their value and influence. Thirdly, disputes have arisen around the

implementation rules, for instance, when authorities extended data localization obligations beyond critical information infrastructure (CII) operators to all networks. Lastly, international stakeholders have expressed concerns and objections regarding unreasonable localized storage, overly broad regulation, and ambiguous rules (Brookings; Wang H. and Miao L., 2022; Liu J., 2019).

China considers data localization as a crucial measure for safeguarding political security against potential foreign threats. The main driving forces behind China's strict regulatory regime on cross-border data flows are security needs, economic and industrial advantages, and technological development (*Ibidem*).

As for security needs, China's national cybersecurity[88] policy is motivated not only by concerns of unauthorized data use by non-state actors but also by fears of malicious foreign surveillance aimed at subverting the country's political regime. The transfer of important data abroad is a particular concern for China, as it may reduce the ability of operators of critical information infrastructure to exert control over these data and increase their vulnerability to security risks.

In terms of the economic benefits of data, gain and losses are obvious. To begin with, the storage of substantial amounts of data in China will foster the development of the Internet Data Center (IDC) and big data industries. Second, the utilization of big data will bolster China's digital economy, which represented 34.8% of GDP, totaling 31.3 trillion yuan in 2018 (*Ibidem*). In recognition of data as a significant strategic resource, the central government has introduced proposals for constructing a digital economy that prioritizes data as the main factor in promoting the new economy, and the state is also considering measures and strategies to monetize public data.

Lastly, China's data-related legislation is not only aimed at safeguarding personal privacy and cyber security, but also at promoting the growth of the domestic technology sector, achieving science, high-tech self-sufficiency and the global technological leadership (China as independent and advanced tech system) as clearly depicted in 14th Five-year Plan and Made in China 2025 strategy.

Nevertheless, these strict measures would potentially cause setbacks and seem to be in contrast with China’s effort to shape the international environment and promote the development of norms and rules related to data governance that align with its domestic

[88] “Cybersecurity is the practice of protecting critical systems and sensitive information from digital attacks. Also known as information technology (IT) security, cybersecurity measures are designed to combat threats against networked systems and applications, whether those threats originate from inside or outside of an organization” (https://www.ibm.com/topics/cybersecurity, accessed on 29/04/23).

approach. These restrictions could potentially harm international trade and cause retaliation, which may result in Chinese domestic enterprises being blocked from overseas markets. Furthermore, the lack of trust in China may also prevent data in developed countries with higher market values from flowing to China. Given Chinese approach to cyber trade, there is a possibility that foreign demand for reciprocal treatment will increase. Therefore, China is accelerating its domestic personal information protection legislation to facilitate data inflow into China. Additionally, China has started leveraging international agreements to encourage two-way data flows. One Belt, One Road initiative is one of these (*Ibidem*).

In the past decade, the exponential growth of the mobile Internet has resulted in the accumulation of vast amounts of data (especially in China), which has become an essential resource in the digital era. The future is unlikely to benefit from protectionism and Internet sovereignty, as the value of data is gaining relevance and data is becoming more like water and air which is indispensable in daily life. Therefore, there is a global and Chinese interest in unlocking the value of data through a balanced data asset ecosystem. In this sense, China has the opportunity to lead the world in building its own data asset ecosystem and become the world's largest data resource country with a global data center. China's current cross-border data flow policy system is not yet mature, but with future adjustments on protecting data privacy, security, and transparency, along with the loosening of China's protectionist measures, the economic value of data can be released and this can occur through a series of business models, such as data platform transactions, data banks, data trusts[89], and data intermediaries, connecting government, businesses, and consumers. According to Wang and Miao (2022), the data platform transaction model will continue to gain momentum in China, becoming a key business model for data flows. Cities with active data ecosystems, such as the Global Big Data Exchange in Guiyang and the Shanghai Data Exchange Center, have already implemented government-led data exchange models. These platforms bridge data supply and demand and are supported by professional third-party technologies and government supervision to promote transactions and flows of data. This new phase of Globalization 3.0 basically involves an exchange across national borders in data, information, technology, and finance. A balanced data asset ecosystem can unleash the value of data, making it the driving

[89] "A data trust is a legal and technical framework for sharing and managing data. A data trust promotes and facilitates data sharing amongst organizations by ensuring trust in the rules, data security, confidentiality and privacy. A data trust comprises of two key elements: legal agreements and a technology platform to collect, aggregate, protect and manage the data"(https://www.cremeglobal.com/what-is-a-data-trust-the-complete-guide-for-organizations-regulators-and-manufacturers/#:~:text=A%20data%20trust%20is%20a%20system%20and%20legal%20entity%20that,and%20access%20to%20the%20data., accessed on 29/04/23).

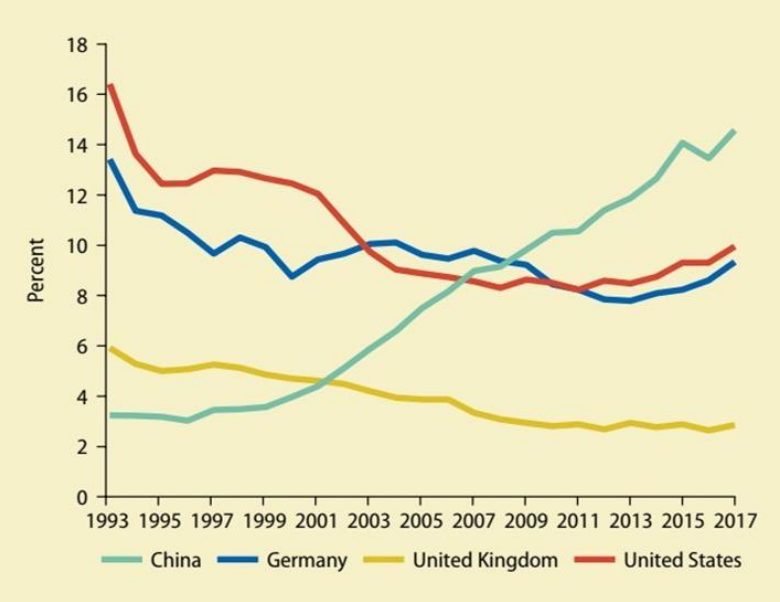
force behind this new wave of Globalization, with China set to be in a leading position for this new digital era.

2.5.5. A global powerhouse in a changing nature Globalization

China's strong ability in export sectors has been crucial in determining its rise as a global powerhouse and superpower in technology (Athukorala, 2017). China is now the largest international trader in the production of goods and the second largest trader in the services sector.

Indeed, Figure 2.42 shows a rapid expansion of the value of Chinese goods exports on a global scale (compared to Germany, UK, USA) from 1993 (below 4%) until 2017 (14.6%) (World Bank and DRC, 2019).

Figure 2.42 Share of Chinese exports on a global scale (1993 -2017) (%)



Source: World Bank and DRC, 2019, p.124

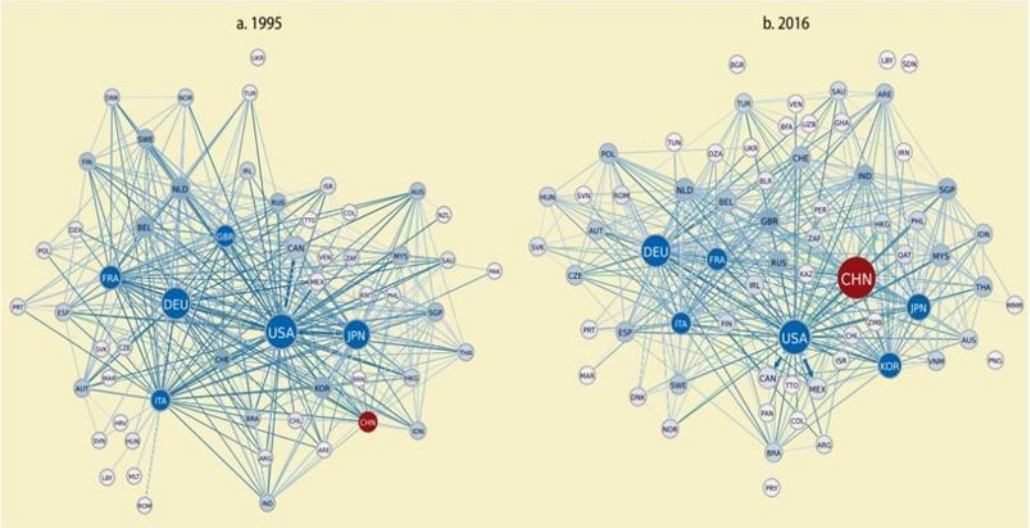
Figure 2.43 shows how, following its integration into the global market dominated by trade in intermediate goods within GVCs, the Chinese economy has undergone a profound evolution from an initial marginal position to become one of the three largest global production centers within GVC systems, alongside Germany and the United States of America.

‘‘China is a prime example of using GVCs to improve supply-side productivity and competitiveness. To facilitate its integration into GVCs, China has invested heavily in transportation, the Internet, and information and communication technology (ICT)– related

infrastructure and carried out reforms to promote foreign investment, improve trade and investment facilitation, and strengthen the business environment'' (*Ibidem*, p.124).

Indeed, based on the economic fitness[90] indicators, it can be observed that China is gradually catching up with the so-called fully developed countries.

Figure 2.43 Global structure of intermediary trade (1995 -2016)



Source: World Bank and DRC, 2019, p.125

As a global powerhouse, China not only focuses on improving the quality of its inward FDI[91], it also projects itself outward as a stakeholder, donor and major international partner with a series of initiatives aimed at reaching global development (ODI). Through its investment plans (especially towards Africa, Asia and Latin America) and with its engagement in international cooperation, China contributes to global economic growth as a major actor in Globalization (Johnston and Rudyak, 2017; Song et al., 2017). Indeed, while China's economic investment plan was originally "shaped by Globalization" (as aid recipient), since the last decade it is primarily aimed at "shaping Globalization" (as aid provider) (*Ibid*., p.439).

In recent times, this China's shaping Globalization path has faced challenges due to various factors, which have led to a relative decline in Chinese outward foreign direct investment (ODI) in some regions of the world. These factors include increased government

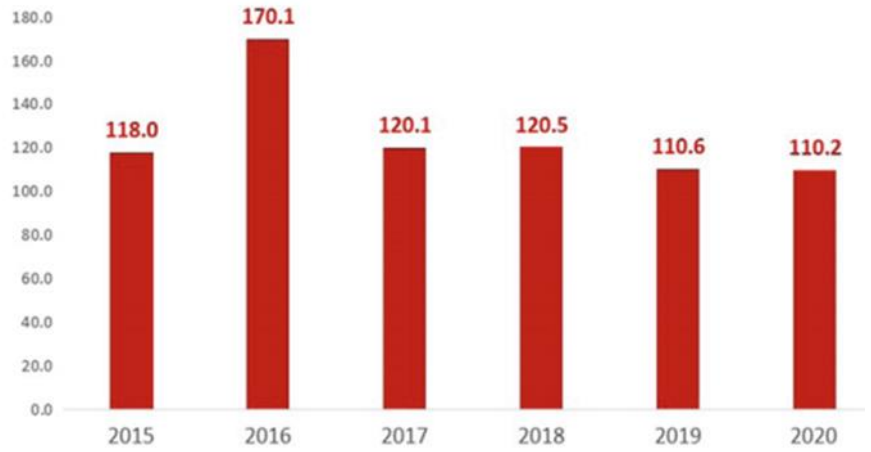
[90] "Economic fitness is a measure of the complexity-weighted diversification of a country's exports" (Cristelli et al. 2017; Tacchella et al. 2012, in World Bank and DRC, 2019, p.125). "An economy is more complex if more varied and useful knowledge and capabilities are embedded in it and are reflected in its exports. China's economic fitness far exceeds that of countries with a similar gross domestic product (GDP) per capita and is now comparable to that of some high-income countries. Its fitness is approaching the global frontier, due to the complexity of the goods and services it produces competitively and the wide range of sectors that it exports" (World Bank and DRC, 2019, p.125-126).

[91] Over time, China shifted its target from attracting investment in the light textile manufacturing industry to FDI in manufacturing, and finally in high-tech (UNCTAD, 2022, p.45).

control over capital outflows, commercial and technological disputes with the United States, and the COVID-19 pandemic. However, this does not indicate that China will become more isolated in the near future. Instead, China aims to reduce its vulnerability to international economic shocks. This is reflected in the proposals for the 14th Five-Year Plan and the dual circulation strategy, which shifted the focus of Chinese investment abroad towards quality over quantity and prioritize strategic sectors such as high technology in China's development (Figure 2.44) (Wang H. and Miao L., 2022; Fariselli P., 2020; World Bank e DRC, 2019; Brookings; Merics; UNCTAD, 2022).

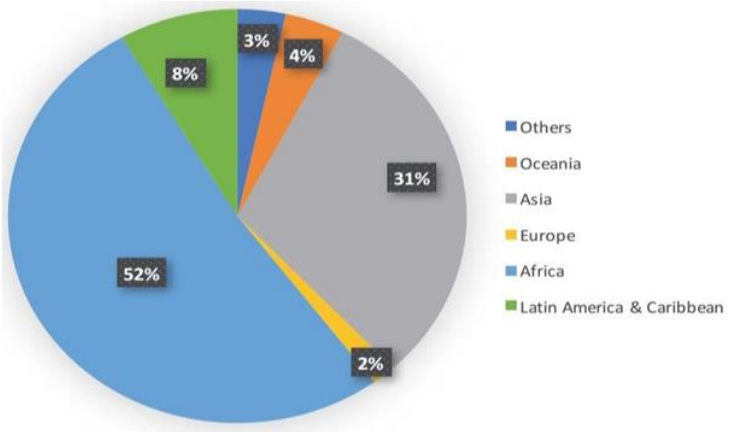
However, despite what is shown in Figure 2.44, Figure 2.45 in fact depicts the modern configuration of China's foreign economic investment policy, within which Africa, Asia and Latin America continue to attract Chinese interest by getting more than half of the total share of Chinese state investments.

Figure 2.44 Chinese non-financial investments abroad (USD billion)



Source: Wang H. and Miao L., 2022, p.82

Figure 2.45 China's foreign aid by recipient region (%)



Source: Johnston L.A., Rudyak M., 2017, p.440.

Since it is one of the most important international players, China has launched a series of initiatives (BRI) aimed at reaching economic and trade development on a global scale that reshape the profile of this new wave of Digital Globalization, as previously mentioned (*Ibidem*).

Having established a strong basis for its digital economy[92], China wants to leverage its role as a central hub in GVCs and the Belt and Road Initiative (BRI) to enter the next stage[93] of its development strategy. This phase aims to integrate digital technologies with the real economy [94], society [95], and government functions to advance domestic economic modernization and upgrading on the one hand, while on the other, China seeks to export its vision for digital transformation and e-governance to the world, particularly to developing economies (Global South). For instance, Figure 2.46 estimates that Huawei already built around 70 percent of 4G networks in Africa (2020-2021) (*Ibidem*).

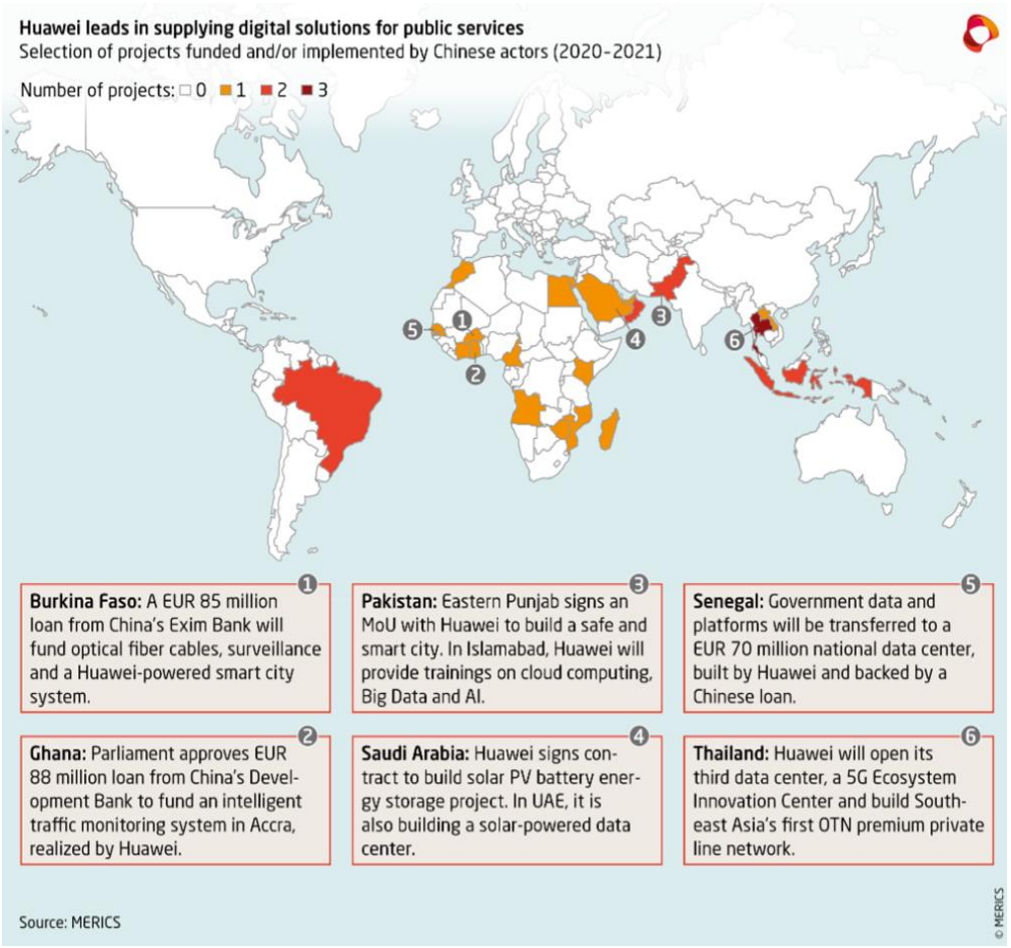
[92] "Traditional infrastructure has supported China's emergence as a global manufacturing powerhouse. Now China is working to tap the significant potential for digitalization and technological innovation to create demand, drive productivity gains and improve resilience and environmental sustainability across all industries and sectors in China with new infrastructure being the backbone to deliver these economic, social and environmental benefits" at home and also abroad (Wang H. and Miao L., 2022, p.117).

[93] "There is great potential for data and digital technologies to deliver better livability, sustainability and economic outcomes in smarter cities, where technology and applications and data analytics connect the physical infrastructure with users, to improve quality of life across different areas" (Wang H. and Miao L., 2022, p.117).

[94] "Digital technologies will be highly integrated with the real economy, helping traditional industries to upgrade and fostering the emergence of new industries, new types of business and new business models" benefiting from "cloud computing, big data, IoT (particularly for automobiles, medical devices and home appliances), industrial internet" (smart manufacturing), "blockchain, artificial intelligence, […] virtual reality or augmented reality […]" (Wang H. and Miao L., 2022, p.117-118).

[95] "More public services will incorporate digital delivery to improve accessibility and convenience including education, medical and elder care. All aspects of daily life will become more digital including consumer spending, home life, tourism and leisure, transport etc." (Wang H. and Miao L., 2022, p.118).

Figure 2.46 Selections of Huawei projects in the developing economies – Global South (2020-2021)



Source: Merics, https://merics.org/en/report/e-government-and-covid-19-digital-china-goes-global, accessed on 29/04/23

In doing so, China aims to expand its digital services and data governance approach through the Digital Silk Road (DSR), which aims to export internet infrastructure (fiber optic cables and data centers), promote e-commerce, and develop common internet technology standards among participating countries. These initiatives are combined with other Belt and Road Initiative (BRI) projects, such as smart cities, ports, and space systems. These developments provide new opportunities for China to expand access to data and integrate DSR countries into a broader digital ecosystem centered around China (*Ibidem*).

As a conclusion, within the current scenario of profound geopolitical uncertainty and disruption generated by Digital Globalization, a potential response from China depends on its role as a driver in the development of the ICT industry in South-East Asia (FDI and ODI) and in major international cooperation initiatives (BRI - DSR). In an effort to reach the global technology frontier, FDI and ODI in manufacturing and services will be crucial for China in

driving the country and the South-East Asian region towards technological innovation with potential benefits on a global scale. In addition, “with China forecasted to generate more data than any other nation in the world by 2025, and its strides in becoming a digital nation” (Wang H. and Miao L., 2022, p.91), it would be interesting to analyze the extent to which China will use major international cooperation initiatives (BRI - DSR) as a tool to create GVCs, Regionalization policies, thus becoming a driver of a more inclusive China-led Digital Globalization as it will be further analyzed in the following chapter (Wang H. and Miao L., 2022; Fariselli P., 2020; World Bank e DRC, 2019; Brookings; Merics; UNCTAD, 2022; Shi-Kupfer K., Ohlberg M., 2019).

Chapter 3. Belt Road Initiative: the future is digital

The project that currently conveys the largest share of Chinese OFDI is the one that refers to the Silk Road and is identified by the acronym BRI - Belt and Road Initiative. BRI has a basically Central Asian projection, but also expands itself including European, Middle Eastern and North African countries. It is a complex and articulated initiative promoted by the Chinese government and includes various projects, coordinated by different Ministries, which evolve over time depending on the geopolitical relations and the inter - governmental agreements underlying these projects. BRI uses financial resources that include investments, loans, joint ventures, and various cooperation instruments managed by different Chinese, Asian and international financial institutions. Due to these characteristics of strong planning and flexible implementation, it is difficult to quantify precisely the amount of financial resources that will be mobilized, but investment projects are estimated to be around $1 trillion over a 10-year period starting in 2017 (Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Su, C., & Flew, T., 2021; Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Schneider, 2021; Brookings; Xiangming Chen, Julie Tian Miao, Xue Li, 2020).

BRI's main purpose is to establish a modern infrastructure network that, through cross-country connectivity (maritime, terrestrial, digital) of a huge area - currently fragmented and relatively isolated from the major trades of Globalization -, will stimulate the economic growth and development of the area itself. The Belt and Road Initiative (BRI) is being implemented through a dual-layered approach. The first encompasses the construction of government-level infrastructure that forms the physical Silk Road. This includes cross-regional initiatives focused on enhancing transportation and information technology, i.e., tangible land and sea routes. The second involves the establishment of corporate-level digital infrastructure that forms the Digital Silk Road, i.e., the development of a virtual and intangible line along the tangible ancient route. As the operational arm of the government-party, the SOEs[96] are mainly involved in the implementation of such projects, but private companies also have an interest in considering the establishment of their OFDI strategies from the BRI perspective. The BAT (Baidu, Alibaba, Tencent), as a high-tech enterprise in the internet industry, is one of the main contributors of the BRI - DSR. For instance, Alibaba increasingly directs its investments towards South-East Asia and India, in a kind of global

[96] State Owned Enterprises.

market division with Amazon, which presides over the Western side.

China aims to be the center of gravity of this operation that, in the current scenario of profound geopolitical uncertainty characterized by increasing Regionalization and disruption generated by this new wave of Digital Globalization, many consider as a new "Asian-shaped" Globalization. In this regard, China crosses its global projection with its domestic market needs. Indeed, BRI - DSR serves the purpose of resolving domestic imbalances such as overcapacity in certain industries (e.g. steel; photovoltaics; fiber optic cables); expanding the market reach of industries with different degrees of technological maturity (e.g. HST[97]; EV[98]; 5G and telecommunication infrastructures; smart cities; AI; cloud-based and industrial platforms; data centers; big data; submarine, terrestrial and satellite links; e-commerce; Fintech); leveraging the abundant local resources (e.g. raw materials, labor force) to delocalize low value-added segments of China's GVCs towards the developing countries along the belt; increase the pool of S&T[99] and R&D resources through cooperation agreements with BRI countries as a follow-up of inter-governmental infrastructure financing projects (Fariselli, 2020, p.51).

At the same time, BRI - DSR exerts a strong weight in China's geopolitical positioning, as it networks the government with a very large and heterogeneous group of states (65) on a politically neutral but substantially influential level, and also exerts a strong weight on the country's internal cohesion, as it conveys an idea of leadership based on internal solidarity and international cooperation. Ultimately, BRI offers China the value framework to which refer to in order to gain power and legitimacy internally and externally, and also to fill the power gaps that the US self-exclusion from regional trade cooperation agreements have left (2018[100]) and that China is ready to fulfill (Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Su, C., & Flew, T., 2021; Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Schneider, 2021; Brookings; Xiangming Chen, Julie Tian Miao, Xue Li, 2020).

Starting from the abovementioned premises, this final chapter is organized as follows. Firstly, an outlook on and a general description of the Belt and Road - Digital Silk Road Initiative's main objectives and projects are given, alongside a focus on BRI - DSR as a tool for a new China-led Global Regionalism. Alibaba and its initiative for global trade eWTP - electronic World Trade Platform – is then presented as the main case study, since in terms of progress and importance, it shows China's digital and market achievements. This work

[97] High-Speed Train.
[98] Electrical Vehicles.
[99] Service and Technologies.
[100] https://www.twai.it/journal/tnote-63/, accessed on 23/05/23.

“argues that the Alibaba’s eWTP digital platform is a counter-hegemonic discourse that - based on the economic and technological power of Alibaba and its support of the BRI” and Chinese government - “attempts to globalize” a China-led “global digital trade order to challenge the previous wave of” West-led Globalization and “the existing global trade regime” (Seoane MFV, 2020, p.68, 79; Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Su, C., & Flew, T., 2021; Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Schneider, 2021; Brookings; Xiangming Chen, Julie Tian Miao, Xue Li, 2020).

3.1. Belt and Road Initiative and Regionalization

From a geographical and economic standpoint, the Belt and Road Initiative (BRI) has a global footprint, since it encompasses around 65 countries, including China, which accounts for about 60% of the global population. In addition, all the countries involved in the initiative make up approximately one-third of the world's gross domestic product (GDP) and trade. However, looking beyond a simplistic and static global perspective, this section aims to explore the BRI as an epoch-making period of new Regionalism, serving as a critical means in understanding global, national, and local processes. Specifically, a new regional-centric approach is adopted to demonstrate how the BRI has impacted Globalization, urbanization, and development across various countries and cities, highlighting place-specific processes and outcomes that have arisen along the BRI's regional corridors across Europe, Asia, and Africa. At the end of this section, the characteristics of the BRI will be analyzed as a new type of Global Regionalism and a framework for better understanding its wide-ranging impact on Globalization, urbanization, and development will then be proposed (Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Bora LY, 2020; Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Johnston, L. A., 2021; Wang and Miao, 2022; Schneider, 2021).

3.1.1. BRI as new Regionalization - Origin and evolution

In September 2013, during a speech concerning China's Central Asia strategy at the Nazarbayev University of Astana in Kazakhstan, Xi Jinping made the first official mention of the infrastructure project that he called the “Silk Road Economic Belt” and the “21st Century Maritime Silk Road” (Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie

Tian Miao, Xue Li, 2020; Bora LY, 2020; Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Johnston, L. A., 2021; Wang and Miao, 2022; Schneider, 2021).

The ancient Silk Road, from which the project takes its name, was a land and sea communication route that aimed at facilitating trade between China and the regions of India, the Middle East and Eurasia (Fig.3.1). It was established during the Han Dynasty in China (206 B.C. - 220 A.D.) and officially used from 130 B.C. until 1452 A.D. Then, the Ottoman Empire closed the trade routes between China and European regions.

Figure 3.1 The ancient Silk Road

Source: Fariselli, 2020, p.394

Xi Jinping's New Silk Road follows the ancient land and sea route, relying on cutting-edge technology and infrastructure in which China has a comparative advantage. By land (Silk Road Economic Belt), the aim is to connect China's inland regions to Europe and Central Asia. By sea (21st Century Maritime Silk Road) the aim is to connect South-East Asia region to China's Southern provinces. The project, from 2013 to 2016, was also named One Belt One Road - OBOR; but the name was later changed as it was misleading for public interpretation. Indeed, the name stressed the word “one”, which recalled only a land and a sea route. On the contrary, the project exploits its territorial extent and take advantage of six land trade routes and one sea trade route. Moreover, “one” was a word to be avoided to ward off criticism that would have described the project as China-centered. With the adoption of the name Belt and Road Initiative - BRI, the message is that of an open strategy, an initiative taken by China for the benefit of all countries involved (*Ibidem*).

Figure 3.2 The Belt and Road Initiative's (BRI) six (regional) corridors

- The New Eurasian Land Bridge Corridor
- The China–Mongolia–Russia Corridor
- The China–Central Asia–West Asia Economic Corridor
- The China–Indochina Peninsular Corridor
- The Bangladesh–China–India–Myanmar Corridor
- The China–Pakistan Economic Corridor

Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.19

There are six overland economic corridors mapped so far (*Ibidem*).

1. *New Eurasian Land Bridge*

   A railway route to Europe, passing through Kazakhstan, Russia, Belarus and Poland.

2. *The China, Mongolia, Russia Economic Corridor*

   A rail and road link along the Mongolian steppe which connects to the Land Bridge.

3. *The China, Central Asia, West Asia Economic Corridor*

   It links Kazakhstan, Kyrgyztan, Tajikistan, Uzbekistan, Turkmenistan, Iran, and Turkey.

4. *The China Indochina Peninsula Economic Corridor*

   It connects Vietnam, Thailand, Laos, Cambodia, Myanmar, and Malaysia.

5. *The China, Bangladesh, India, Myanmar Economic Corridor*

   This route is on hold in planning due to diplomatic instability between India and China Over security issues.

6. *The China, Pakistan Economic Corridor*

   It mainly affects Xinjiang Province. It is an important route as it connects the city of Kashgar (Free Economic Zone) and Xinjiang (hinterland) to the Pakistani port of Gwadar, a deep-water port used for commercial and military purposes.

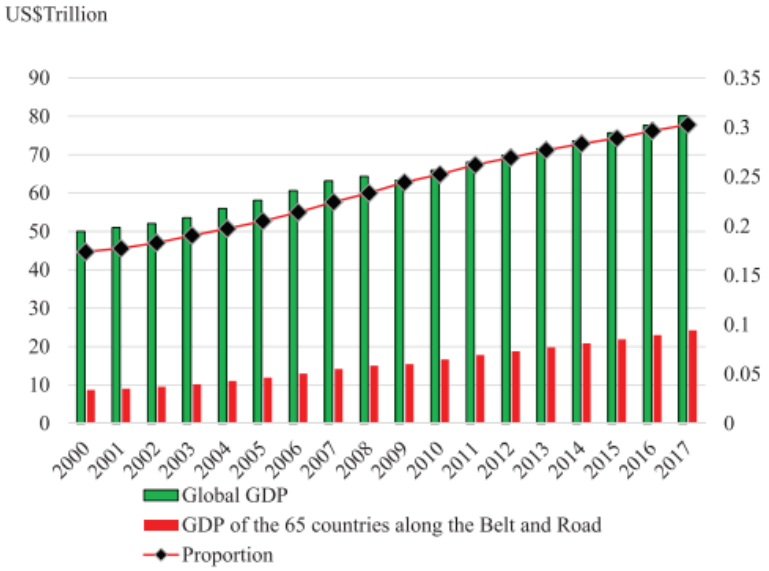
With the Chinese state playing a leading role, the BRI's six corridors are a unique form of Regionalization[101] with significant "glocal" implications and impact across multiple spatial scales due to their long corridor shape, extensive territorial coverage[102], and complex spatial composition since these corridors integrate various cities and areas at different stages of development (*Ibidem*).

The BRI holds significant economic influence at global level, given China's position as the world's second-largest economy and largest trading nation. China's economic strength is reflected in its substantial contribution to the total GDP and trade of BRI countries. Notably, China's share accounts for approximately half of the BRI countries' combined GDP and over one-third of their total trade. "Even with China, the original 65 BRI countries' share of the world's GDP grew to only 30% in 2017 from lower levels" (Figure 3.3). "While GDP per capita for the 65 BRI countries grew steadily over the same period, driven largely by China, it remained at 48.9% of the world's average in 2017" (Figure 3.4). "This suggests that China is capable of driving growth in the less developed BRI countries by generating more trade and investment. In 2013 when the BRI was launched, the BRI countries accounted for 25.0% of China's total trade. This figure rose went up to 26.5% in 2017. China's imports from the BRI countries rose 12.1%, while its exports to the BRI countries dropped 3.9% between 2013 and 2017. More recent data show that cumulative total trade between China and BRI countries reached US$7.8 trillion during 2013–19, with an average annual growth of over 6%. China's trade with BRI countries totaled US$1.34 trillion in 2019 (US$762.3 billion for China's exports and US$581.7 billion for China's imports), up 10.8% year on year, outpacing China's aggregate trade growth by 7.4%. The BRI countries' share of China's total trade approached 30% in 2019, up 2 percentage points from 2018. China has become the biggest trade partner for 25 BRI countries" (Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.20-21-22).

[101] Regionalization is not a countertrend to Globalization; instead, it serves to both scale up and reinforce it, as it will be further discussed in this section and later in this chapter (Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Fariselli, 2020, pp. 393-426).

[102] Although the infrastructure project is bold in size and timing, there are already many regional and intercontinental railway routes connecting China to Europe via the Middle Eastern and Balkan countries. For instance, since 2008, the Chengdu-Lodz, Chongqing-Duisburg and Zhengzhou- Hamburg lines have been in use, which were created with the initial purpose of facilitating the communication network in the Global Value Chain of the European and Chinese electronics and automotive sectors. The Trans-Siberian North and South railway lines are also currently used for the transport of products between China and Europe, although Russia has taken a completely neutral stance towards the BRI project. The railway section on Russian territory is exclusively dedicated to the transit of goods, without any stops for loading or unloading. According to data, in the first half of 2018 the number of trains in transit was 2.497 (with 1.483 trains going to Europe and 1.014 to China) (Fariselli, 2020, pp. 393-426).

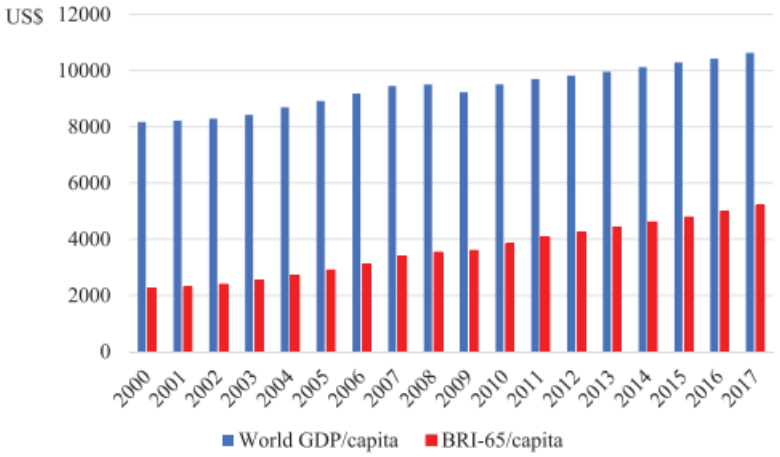
Figure 3.3 Global gross domestic product (GDP) versus the GDP for 65 BRI countries



Source: Compiled from the World Bank online data at https://data.worldbank.org/indicator/NY.GDP.MKTP.CD.

Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.21

Figure 3.4 World's gross domestic product (GDP) per capita versus GDP for 65 BRI countries per capita



Source: Compiled from the World Bank online data at https://data.worldbank.org/indicator/NY.GDP.MKTP.CD.

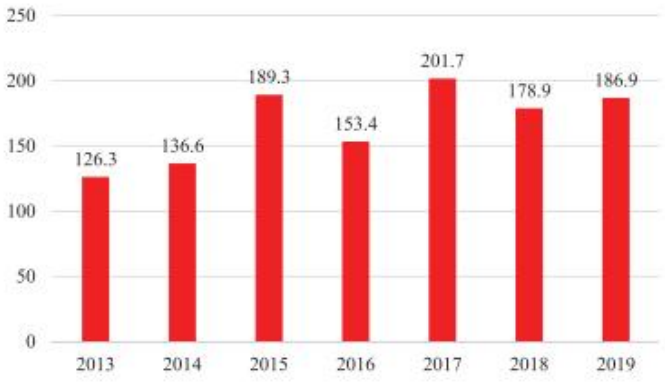
Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.21

China's investment in the BRI is directed through four distinct channels: policy banks, state-owned banks, sovereign wealth funds (SWFs), and international financing institutions. Among these, the China Development Bank (CDB) and Export and Import Bank of China (EximBank), collectively known as policy banks, are the primary direct sources of funding for the BRI. The four state-owned banks, namely Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Agricultural Bank of China (ABC), and Bank of China (BOC), contribute to BRI by primarily financing domestic projects. SWFs, such as the

Silk Road Fund (SRF), which invest in bonds, precious metals, and real estate, participate in funding BRI projects worldwide. The fourth channel includes institutions such as the Asian Infrastructure Investment Bank (AIIB), consisting of 56 member countries, which has invested in projects in emerging Asia through the BRI. These institutions leverage the strategic and robust financing capacity of the Chinese state and utilize it to support the BRI's objectives (Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.22).

According to optimistic estimates, the Belt and Road Initiative (BRI) is projected to require a substantial investment ranging from US$4 to $8 trillion, with no specified timeline for completion. Over the span of 10 years starting from 2017, BRI investment projects are anticipated to contribute over US$1 trillion in outward funding for foreign infrastructure. This makes the BRI the most extensive and expensive initiative in human history. From 2013 to 2019, China's cumulative investment in the BRI amounted to approximately US$180 billion, constituting 8.2% of China's total foreign direct investment (FDI) stock up to that point. Figure 3.5 illustrates the annual flow of China's investment into BRI countries, which experienced fluctuations over time. In 2019, this investment flow reached US$18.7 billion, accounting for 13.7% of China's total FDI flows, up from 11.7% in 2013 and 12% in 2017. Adopting a broader perspective, the combined value of BRI investments and construction contracts between 2013 and 2018 amounted to US$614 billion, representing 53% of China's global transaction value and 61% of the number of such contracts (*Ibidem*).

Figure 3.5 China's annual investment flows into BRI countries (2013–19)



Note: Hundred million US$
Source: *The Statistical Report on China's Foreign Direct Investment 2019*. Available online at: https://mp.weixin.qq.com/s/y6Yz4_nShjPdfWbUV9y_aw

Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.23

In addition, "Chinese enterprises invested over US$90 billion directly in the BRI countries, with an average annual increase of 5.2% during the period 2013–18. The contract value of newly signed overseas projects in these countries registered over US$600 billion,

representing an average annual increase of 11.9%, although state-sponsored BRI investment has slowed since the second BRI forum in April 2019 and the outbreak of the COVID-19 pandemic in early 2020. However, China's state and private companies form the sources of the BRI's investment beyond the four official channels. Besides accounting for a growing share of China's trade against the slowdown in overall global trade, the BRI absorbed a massive amount of Chinese outward investment through a variety of public and private financing channels. An increased volume of this investment has been attributed to and claimed by the BRI since 2013" and "some of China's overseas projects that started right before or around 2013 were retrospectively added into the BRI's total financing. To the extent the BRI has generated a substantial amount of China's foreign trade and investment, its worldwide influence becomes more meaningful if viewed through a regional lens on China's domestic economic and spatial transformations" (Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.23-24).

3.1.2. BRI from China's regional perspective – Objectives

This section seeks to challenge the commonly held notion that the BRI is solely an external strategy for China to increase its global influence. Instead, it argues that the BRI is deeply linked to China's diverse domestic regional spaces and objectives. To support this claim, this section draws on the analysis presented in Chapter 2, which examined China's ICT GVC reconstruction and the spatial transformation of its economy over the last 30-40 years. By recasting this transformation as two historic turns, this section illustrates how China's domestic regional context provided the input for the BRI's regional orientation and trajectory. Additionally, it highlights how the two turns have shaped the origins and directions of the BRI corridors, which serve as cross-border paths for economic cooperation and development, linking China's West and South-West regions. Table 3.1 provides an overview of the two turns and their influence on the BRI's corridor-centric regional forms and impacts (Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Bora LY, 2020; Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Johnston, L. A., 2021; Wang and Miao, 2022; Schneider, 2021).

China embarked on its first historic turn towards its coastal region in the early 1980s. This shift was evident through the establishment of four Special Economic Zones (SEZs) in 1979 along the South-Eastern coast and the subsequent creation of Economic and Technological Development Zones (ETDZs) in 14 other coastal cities, including Shanghai, in

1984. At that time, East Asian economies such as Hong Kong, Taiwan, Korea, and Japan were seeking to relocate their labor-intensive industries, and China's coastal cities with special economic zones offered favorable locations, well-developed seaports, and better infrastructure facilities. This concentration of economic activity led to interregional inequality between the South-East coastal region and the rest of the country in terms of foreign direct investment (FDI), exports, global trade, income per capita, and economic dynamism. These imbalances posed challenges to achieving balanced development and political stability.

In response to these challenges, the Chinese government implemented a series of policies starting in 1992, constituting the historic second turn in development strategy towards the inland and Western regions. In that year, favorable FDI policies, such as reduced taxes and faster project approval, were extended to all capital cities of inland provinces, 13 border cities, and 10 Interior cities along the Yangtze River Delta. The push towards the interior and Western regions gained further momentum in 1997 when the central government elevated Chongqing to the status of a central government municipality, designating it as a key hub for the Western region. However, it is from the year 2000 that the second historic turn truly took hold with the official launch of the "Go West" policy. This policy spurred the establishment of 17 new ETDZs, predominantly located in the West, between 2000 and 2002. While the "Go West" policy formed the domestic component of China's second turn, the complementary international aspect was embodied by the "Go Global" policy, officially initiated in 1999. These two policies served as the logical and geographical foundations that ultimately culminated in the emergence of China's Belt and Road Initiative (BRI) in 2013, representing the edge of the second turn in development strategy (*Ibidem*).

China's second turn, which occurred around the year 2000, marked the halfway point of China's forty-year-long domestic transformation and global integration. The two turns involved opposing geographical directions, with the first turn focusing on China's coastal region and the second being oriented towards the West. While the first turn aimed to connect China to the global economy using sea routes, the second was geared towards creating overland connections with neighboring countries along China's Western frontier, including landlocked economies in Central Asia. The first turn prioritized export-oriented manufacturing and resulted in the establishment and consolidation of manufacturing hubs and supply chains in regional clusters. Conversely, the second turn favored infrastructure-oriented development, which could reshape the nation's manufacturing landscape dominated by the coast and create benefits for the less developed Western border regions. In May 2020, China unveiled the dual circulation strategy (DCS), which is seen as a possible "third turn" in

response to “the volatile and hostile global economic and geopolitical environment shaped by the pandemic and the US-China potential decoupling” (Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.26). The DCS aims to rebalance China's dependence on global exposure and integration, exemplified and advanced by the BRI, by increasing domestic consumption and production relying on internally integrated supply chains. “Given the powerful domestic anchor and push for the BRI, the DCS can augment and refine the BRI’s inside-out logic and extension by creating richer and stronger domestic opportunities that may lead to more targeted and sustainable overseas projects. This new development should refocus global attention on the outward regional impacts already generated by the BRI through China’s two geographical turns and the BRI’s regionally oriented corridors” (Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Fariselli, 2020, pp. 393-426).

Table 3.1 China’s two historic regional turns, around 1980 versus 2000

West (Eurasia)	Inland (West)	Coastal (East)	East (Asia-Pacific)
• Limited trade • Lower priority • Less political stability • Greater ethnic diversity • Border barriers	• Neglected investment • Lagging development • Origins of out-migration • Supply of raw materials	• Favoured investment • Faster development • Greater prosperity • Destinations of in-migration • Strong global integration	• Sources of capital investment • Trade partners • Export markets • Cultural similarity
	→	→	*First turn*
• Targets of investment • Sites for new infrastructure projects • Connective points	• Infused investment • Faster growth • Return migration • Growing global connections	• Source of investment • Manufacturing relocation • Provider of poverty alleviation	
Second turn ←	←		
**Eurasia (Europe, Central Asia, South Asia and West Asia) benefits from China’s ‘Go West’ and Belt and Road Initiative (BRI) by obtaining heavy Chinese investment	**The inland region lost out and fell behind during the first turn, but it gains from catch-up development during the second turn	*The coastal region benefited from favourable policies such as special economic zones (SEZs) during the first turn and contributed to interior development during the second turn	*East Asian economies (Hong Kong, Taiwan, Korea and Japan) helped China’s coastal region prosper and globally integrate

Source: Lead author.

Note: The first row denotes China’s first double and eastward turn to its coastal region domestically and to the East Asian economies in the late 1970s and early 1980s. The second row characterises China’s second and westward turn to its inland and border regions domestically and to Eurasia and Europe internationally in the late 1990s and early 2000s.Source: Lead author.

Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.24

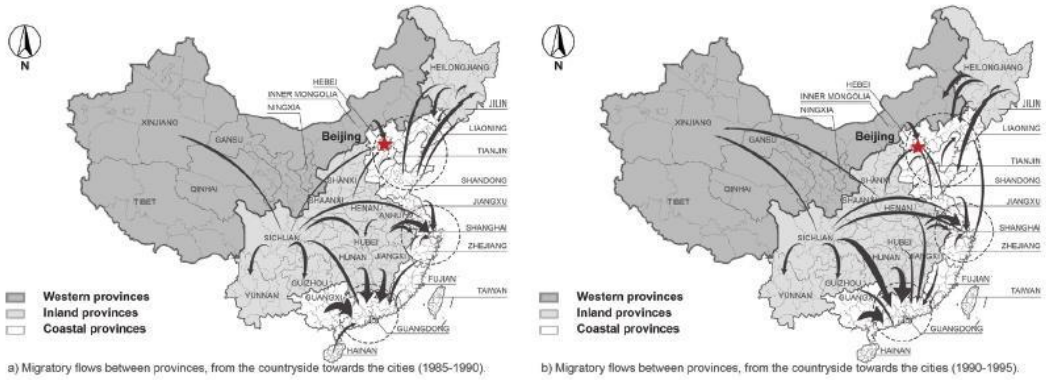
The BRI is also functional to China’s domestic objectives. In this sense, it aims both at domestic policy, in order to solve the problem of regional disparities in China thanks to a period of renewal and modernization, and at external policy, as China intends to use the New Silk Road as a platform on which channeling its production surplus, increasing and facilitating trade with neighboring countries, and exporting its technological and engineering standards. The aim is to consolidate energy, food and national resource security by focusing on a sustainable growth while exercising leadership over production and trade within the BRI area (*Ibidem*).

Regional disparity

The economic disparity between inland and coastal regions is a major challenge for Chinese domestic policy and was perceived as such when Xi Jinping first launched the BRI. China's economy was, until the 1970s, essentially based on agriculture. Indeed, the rural population comprised 82% of the total population in 1978, when Deng's economic reforms began to be introduced. Among these reforms there was the introduction of the household responsibility system, which aimed at the de-collectivization of the land, and gave peasants the right to own the land, the working tools, and the surplus of the harvest, after handing over a quota to the state. Autonomous land management alongside production incentives proportional to the quantity and quality of crops revitalized the agricultural sector in China between 1978 and 1984, with a stagnation from 1985 until 1990. Although the initial benefits on agricultural production rates, there were some problems associated with this reform. Land had been divided equally according to household size. But because China's population outnumbered the land available, each landowner received relatively small portions of land. Moreover, many farmers, concerned about maintaining their property and not losing their investments, had no incentive to modernize agricultural technologies or preserve the land fertility, making it over-exploited and unproductive in the long run. Using the principle of equality for the distribution of the land, the government did not take into account the ratio of land allocation to the actual labor force of family members, resulting in underutilized land that could have been cultivated by potentially more active and specialized families (Fariselli, 2020, pp. 393-426).

This set of circumstances led to a reduction in agricultural production and the growth of surplus labor in rural areas. At the same time, in October 1984, during the Third Plenum of the 20th CPC Central Committee, the concept of commodity economy was proposed; the pivot of the development of the national economy would shift from rural to urban regions, decentralizing and diversifying the administration, investment and rights of the inhabitants of these regions. With the aim of pursuing the open-up strategy introduced by Deng Xiaoping, the coastal development strategy was approved in 1988. This included investments for the development of labor-intensive processing industries, dominated by SOEs in strategic areas, such as coastal areas, where imports of raw or semi-processed materials and exports of finished products would be facilitated by the presence of seaports. Because of this industrialization process, coastal areas attracted and employed much of the labor force that had remained unemployed in rural areas (*Ibidem*).

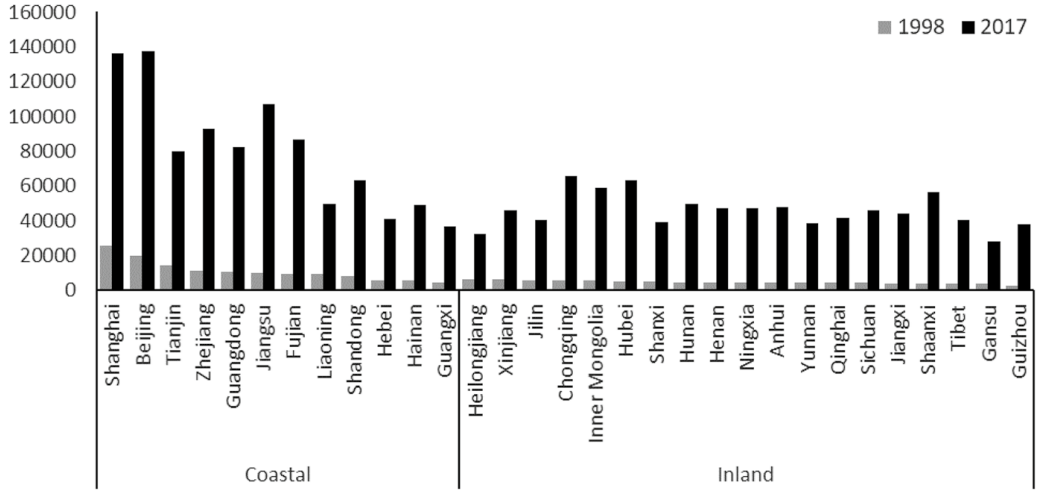
Figure 3.6 Migration from rural to urban areas (a)1985–1990 (b) 1990–1995



Source: Fariselli, 2020, p.399

The labor demand led to the annexation of many rural areas to developing urban hubs, making the inhabitants legitimate urban citizens with the ability to move freely in the cities. Between 1989 and 1997, urban areas received a lot of funding for the construction of infrastructure and public services and, from the 2000s onwards, special attention was given to urban development from a technological and scientific point of view. Indeed, a sustainable and digital-smart urban development plan appeared in the National Medium-Term Plan for Scientific and Technological Development (2006 -2020) (Fariselli, 2020, pp. 393-426). By the end of 2010, 50% of China's population lived in urban areas. However, the extent of cultivable agricultural areas had shrunk, due to the lack of labor and insufficient investment in land management, in the purchase of agricultural equipment and pesticides. Trade depended on the presence of modern infrastructure to connect production centers to the main commercial distribution channels, located in the cities, where residents could also find higher labor demand rates, housing relatively close to the workplace, education, and public services. The result was an enormous economic and development gap between inland and coastal regions (Fig. 3.7). On the other hand, cities began to experience high rates of air, soil, and water pollution due to emissions and deposits of industrial waste in the environment.

Figure 3.7 GDP per capita gap in the Chinese provinces (yuan/person), selected years (1998-2017)



Source: https://link.springer.com/article/10.1007/s40797-021-00169-w, accessed on 23/05/23

The National New-Type Urbanization Plan was adopted by the CPC Central Committee and State Council in March 2014. The plan aimed at urban development, predicting that 70% of people will live in cities by 2030 (*Ibidem*), while pursuing environmentally sustainable development with a focus on life quality. The project includes the agglomeration of new urban centers to existing Economic Zones, which are industrial hubs directly connected to BRI infrastructure systems or served by intercity connections via High-Speed Trains - HST. The advantages of this new urban planning are many: (a) the new cities will be built in less polluted areas, with lower population density and more living space; (b) since the Economic Zones are no more than an hour's journey away from the new urban centers, they will be easily accessible by high-speed trains which, in addition to transporting people, serve the Economic Zones with the transport of raw materials, semi-finished and finished products from the industrial hubs to the city and vice versa, benefiting from other intercity connections; (c) direct connection to BRI infrastructure (as in the case of urban hubs along the Eurasian Land Bridge) will facilitate domestic and foreign trade. The new urban distribution will follow two horizontal axes, i.e., Eurasian Land Bridge and Yangtze River Corridor; and three vertical axes, i.e., Beijing - Harbin, Beijing - Guanzhou, Hohhot - Batou - Kunming.

Xinjiang development

Xinjiang is China's gateway to Central Asia and European markets. It is a landlocked province bordering Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, and Pakistan. The city of Kashgar, in particular, is a commercial hub: the Southern Xinjiang Railway (connecting Turpan - Kashgar, crossing the region from East to West) connects there with the China Pakistan Economic Corridor (one of the main BRI projects) (Ghosh S., Majumder S., 2019; Fariselli, 2020, pp. 393-426). For almost five decades, political and social tensions (protests for ethnic-religious diversity), a local economy primarily based on agriculture and livestock breeding, and the country's internal location have kept the region economically and technologically backward, especially when compared to the degree of industrialization of coastal areas. Beijing, through development and cooperation policies such as the BRI, aims to improve the political and social stability of this region. In doing so, Beijing aims at facilitating infrastructure construction and Free Trade Zones - FTZs implementation while increasing border control in order to ensure economic development for the region (*Ibidem*). Investments of 46 billion dollars have been made by SOEs and financial institutions in favor of the China - Pakistan Economic Corridor project. In addition, an economic plan called “pairing assistance “was implemented, according to which the 19 participating Chinese regions and cities donated part of their annual budget (from 0.3% to 0.6%) to the Xinjiang region (*Ibidem*).

Today, in addition to the construction of the China-Pakistan Economic Corridor, which includes roads, railways, FTZs and port cargo terminals, there are plans to improve the Karakoram highway as the main artery between China, Central and South Asia. In addition, the construction of a 6.6-hectare FTZ in Tashkurgan, on the border with Pakistan, Afghanistan, and Tajikistan, was initiated in 2014, which will foster trade, the emergence of new urban settlements, tourism, and the hotel industry. The China-Pakistan Logistics Hub will also be opened in Tashkurgan, which will include an administration center for local internet services, a hub for e-commerce companies working on the border, warehouses, logistics centers, exhibition and entertainment centers. Unlike the Open Up the West[103] campaign, where the plan consisted of a re-distribution from the center to the underdeveloped peripheries, with the BRI the border areas and peripheries themselves are re-evaluated as potential new centers of the country. Through fundings and infrastructures construction, these

[103] Open Up the West is a campaign initiated in 2000 and presented as a major state project targeting inland provincial jurisdictions, in order to encourage endogenous economic growth, reduce socio-economic inequalities, and ensure social and political stability in non-Han areas of the PRC (Fariselli 2020, p.393-426).

areas will be transformed into China's commercial and diplomatic expansion nodes (*Ibidem*).

Shanghai Cooperation Organization

The SCO is an intergovernmental organization founded in Shanghai on 15 June 2001. The SCO currently comprises eight member states (China, India, Kazakhstan, Kyrgyzstan, Russia, Pakistan, Tajikistan and Uzbekistan), four observer states interested in full membership (Afghanistan, Belarus, Iran and Mongolia) and six "Dialogue Partners" (Armenia, Azerbaijan, Cambodia, Nepal, Sri Lanka and Turkey) (Fariselli, 2020, pp. 393-426). The birth of the SCO followed the disintegration of the Soviet Union. China rapidly accelerated its boundary delimitation work with Russia, Kazakhstan, Kyrgyzstan, Tajikistan and other countries, attempting to gain its counterparts' trust and to settle military disputes in border regions in a peaceful manner, especially in those with high social tension (Xinjiang). Since its creation, the SCO has mainly focused on security issues. Indeed, the SCO established a regional anti-terrorist organization - RATS in Tashkent (2004) and signed a series of treaties to fight the "three evils", i.e., terrorism, extremism, and separatism. To date, the SCO's priorities also include regional development, the transnational cooperation in trade, economics, science technology, energy, and culture. The aim is to establish trade and investment facilitation processes and to create a favorable environment for goods, capital, services, and technology free movement. The organization is closely linked to BRI since it laid its foundations (*Ibidem*).

Overcapacity

The country's overcapacity problem (for more information see Fariselli, 2020, pp. 36-37-38) has become a priority for the Chinese government, as this may lead to decreasing corporate profits and growing debt, making the country's financial system more vulnerable. Among the measures taken by the central government it is worth mentioning the dismissal of 1.8 million workers from the coal and steel industries and the closure of some steel mills and furnaces (Fariselli, 2020, pp. 393-426). BRI is one of the policy measures taken in order to reduce overproduction. In this case, however, it is not just a matter of exporting excess production via new routes, but of moving entire production plants. The topic was addressed by Chinese Premier Li Keqiang in 2014 speaking to ASEAN leaders in Myanmar. There, he stated that there was an excess - for the Chinese market - of good-quality inputs for the

production of steel, cement and crystals. The aim was to move, through foreign direct investment - FDI, Chinese industrial plants to ASEAN countries that could not only take advantage of such industrial plants to produce locally, but also exploit Chinese technology, skills, and knowledge developed over the past thirty years (*Ibidem*). Another important goal, as stated by Hu Huaibang, president of China Development Bank and the most important funder of BRI projects, is to help China raise the quality level of its industries, moving away from the China's three decades mass-production model of low-price goods manufacturing. The idea is to transfer low-end manufacturing to other countries, relieve the pressure of overproduction on China's companies, and shift the focus on construction engineering, high-speed lines, electrical and telecommunications production. The industrialization of China in the 1980s and 1990s certainly influenced the elaboration of this geo-economic project; at that time, Germany, Taiwan and Japan exported second-hand production lines to China, and now Beijing intends to replicate its experience in neighboring, industrially less developed countries (*Ibidem*).

Export of standards

More recently, the manufacturing advantages that China enjoyed in the past, such as low labor costs or booming demand, have started to diminish as a result of the introduction of new regulations and the partial decline in foreign and domestic demand. For this reason, the Chinese government is seeking to develop new industries, as evidenced by the Made in China 2025 strategy, with the aim of becoming a world leader in the production of high-tech and high-quality goods by the first half of the 21st century, and to raise Chinese technology to a standard on a national and global scale. This goal involves the development of innovative products, the creation of internationally competitive domestic brands and the construction of modern industrial production facilities (Fariselli, 2020, pp. 393-426).

Beijing expects that BRI can play an important role in this strategy by facilitating the export of high-tech and luxury goods to the countries along the belt. Indeed, by leveraging geographic proximity, trade promotion policies, and diplomatic relations established through BRI, China intends to win the competition with European and North American luxury goods producing countries, which currently export high-end goods to the BRI countries. The expansion of the production chain, whose innovation and development center is China, means for the country's manufacturing industries to move up within the Global Value Chain. In addition to the export of goods, the government also aims at the export and adaptation of BRI

countries to new Chinese technological and industrial standards, strengthening Chinese leadership in R&D. The Chinese government's promotion of BRI high speed train – HST is an instance in this sense. Beijing considers this technology as a competitive advantage of Chinese industry, for which 10.000 scientists and engineers have been mobilized to incorporate imported foreign know-how and technologies and, at the same time, to develop original indigenous technology. The result is the obvious Chinese industrial advancement in this sector, with China holding 50% of the world's high-speed railway lines on its territory (*Ibidem*). Thailandia, India, Indonesia, and Malaysia (BRI countries) have already adopted Chinese technologies. It is clear that the adoption of tech standards as national standards generates positive network effects that favor their diffusion over a wider geographic area, thanks to the economic and commercial advantages of sharing the same technical standards.

Sustainable development

The eco-sustainable development is an important issue for the Chinese government, which intends to exploit the opportunities offered by the introduction of new technologies and energy mix to achieve green and low-carbon development standards at domestic level. More specifically, China is aiming to improve inter-regional communications and logistics by entering into agreements with neighboring countries on common environmental policies to foster environmental protection and make communication routes more eco-efficient. China, indeed, states that in the BRI project it will take responsibility for the development, management, and maintenance of green and low-carbon infrastructure, setting stricter environmental standards and also promoting the adoption of green technologies in construction, transport and energy sectors.

China is also encouraging energy companies to invest abroad in green sectors, with the aim of making them national champions. Following its commitment made at the Paris Climate Conference in 2015, many Chinese carbon -based projects and industries have been blocked by the government in order to decrease domestic emissions. Therefore, Beijing and state-owned banks are financing and supporting Chinese companies in order to enter into new contracts in other countries and implement new domestic projects. Therefore, most BRI energy projects have been concentrated in emerging or developing markets to avoid competition and secure supply contracts. The projects are distributed geographically, with the largest number being in South-East Asia, such as two large power generation expansion projects: one derived from coal in Indonesia, the other hydroelectric along the Mekong River

in Laos and Cambodia. Since they are neighboring countries, the Chinese government plans to benefit from the export of energy produced in these countries and to implement an infrastructure network for energy transport from the production areas within China's borders.

Indeed, China is preparing for the growing energy demand of domestic industries while financing power companies to secure contracts and projects around the world, thus gaining large market shares in the energy sector (*Ibidem*).

Agri-business

Food security and supply are major goals for the Chinese government. To date, this has meant investing in development and modernization of local farms with the goal of achieving national food self-sufficiency. Now, the government is changing strategy, shifting the focus from the development of small -medium sized agricultural enterprises to large commercial agri-business operations, investing in agricultural production abroad and opening the country to more food imports.

Overseas investments mainly involve the private sector, including the purchase of factories that participate in the global production chain, such as pork production in the US, soybean production in Brazil, and control over the global seed industry - through the acquisition of majority ownership shares in the Swiss giant Syngenta.

China is also a major importer of soya beans, dairy products, seed oils, sugar, and cereals. Currently, imports of meat and dairy products are on the rise, facilitated by trade agreements with Australia (The China-Australia Free Trade Agreement - ChAFTA) and New Zealand along with the increase in China’s GDP, which has led to an increased domestic demand for these products in recent decades. China also imports 20% of its food resources from the US. However, due to the Trade War launched by Trump, the country has been pushed to look elsewhere for new resources (Fariselli, 2020, pp. 393-426). For these reasons, the BRI is also designed to boost foreign investment in the agri-business sector and related infrastructure, in order to foster efficient trade and communication and affordable food imports for China.

3.1.3. The Free Trade Zones (FTZs) strategy

The Free Trade Zones strategy is among the means China used to realize BRI objectives. As early as 1978, China began creating Special Economic Zones – SEZs

(Shenzhen, Zhuhai, Shantou, Xianmen) to attract foreign direct investment (FDI) within the country. Today, SEZs are very numerous in China: "There are 17 EPZ (Export Processing Zones), 54 Economic Technological Development Zones, 53 High Technology Development Zones and 15 Border Economic Cooperative Areas which includes Free Zones, Duty FZ, Free Ports, Foreign-Trade Zones, Industrial FZ, Export FZ, Qualifying Industrial Zones, Duty Free EPZ, Hybrid FTZ, Petrochemical FTZ, etc.)" (Fariselli, 2020, pp. 393-426; Pacory F., 2019).

The Free Trade Zones strategy is a policy that China implements with neighboring countries and those joining the Belt and Road Initiative to create a "high standard global network of free trade zones [...] to enable better relations and foreign affairs strategies" (*Ibidem*). This is an important tool for foreign manufacturing, as these zones generally allow duty-free imports and exemption of Value Added Tax - VAT. Consequently, "they are valuable sites within which added value production, such as assembly, or working on component parts from different origins can be conducted on a tax-free basis". Thus, "this is a significant factor in reducing manufacturing cash flow operational costs, and also allows for the addition of lower costs labor, depending upon the location, to be factored into the overall production coast rather than being exposed to one salary band in just one Country such as China" (Devonshire-Ellis, 2019). FEZ advantages are further illustrated as follows. "An FEZ is intended to overcome some important market failures and government coordination failures, which include a malfunctioning land market, deficient industrial infrastructure (power, water, gas, telecommunication, waste treatment, etc.) needed for industrial agglomeration, and a poor regulatory and business environment caused by coordination failures within governments or between government and the private sector. In particular, investing in them can (1) provide a bundling of public services in a geographically concentrated area; (2) improve the efficiency of limited government funds or budgets for infrastructure; (3) facilitate cluster development, or the agglomeration of certain industries; and (4) enhance urban development by providing facilities conducive to improved living conditions for both basic wage workers and highly-skilled technical workers, taking advantage of economies of scale in the provision of environmental services, such as water treatment plants and solid waste treatment plants. Thus, the zones can be conducive to both job creation and income generation, and potentially, to protecting the environment and promoting both green growth and eco-friendly cities" (Meng and Zeng, 2019, pp. 95-96; Fariselli, 2020, pp. 393-426).

The FTZs strategy - The Belt and Road Eurasian Land Bridge

The development of the Free Trade Zones along the Eurasian Land Bridge provides an instance of the new industrial production centers, which participate in the supply chain with lower operating and production costs and greater speed and efficiency in freight transport, due to their location within the BRI. For these reasons, many Chinese companies are moving their production facilities along the BRI economic corridors. Local industries in countries such as Kazakhstan, Azerbaijan, Georgia, and Turkey, which are crossed by BRI, are also taking note of the above-mentioned advantages and moving production to the Free Trade Zones. Table 3.2 shows the monthly wage of a skilled worker engaged in manufacturing in the countries crossed by the Eurasian Land Bridge. The large disparity with the Chinese monthly wage could reasonably be one of the reasons why Chinese industries would be more encouraged to move industrial production to these countries, instead of staying at home (Fariselli, 2020, pp. 393-426).

Table 3.2 Monthly basic wage in the manufacturing sector along the Eurasian Land Bridge

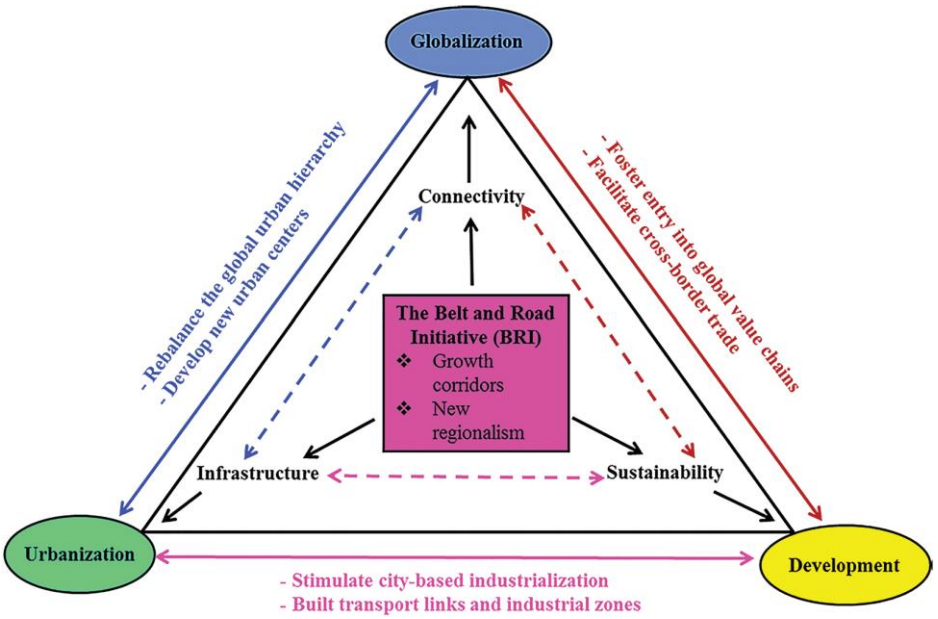
Country	Monthly salary (USD)
China	2788
Kazakhstan	320
Azerbaijan	319
Georgia	338
Turkey	499

Source: Fariselli, 2020, p. 412

3.1.4. Unpacking BRI's regional impacts

This section presents a conceptual framework aimed at understanding and examining the economic and spatial impacts of the BRI on Globalization, urbanization, and development through its regional corridors (Xiangming Chen, Julie Tian Miao, Xue Li, 2020).

Figure 3.8 Framework for analyzing the BRI



Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.27

As illustrated in Figure 3.8, the BRI has the potential to influence Globalization, urbanization, and development through its regional corridors, employing distinct but interconnected mechanisms. On a grand scale, the BRI can reshape the trajectory and consequences of Globalization by establishing new spatial and material connections within its six growth corridors, thereby facilitating increased cross-border trade and investment flows. While Globalization has fostered economic integration predominantly through financial and digital networks, its benefits have primarily accrued to dominant global cities and regions, leaving smaller and geographically marginalized areas at a disadvantage. The BRI endeavors to bridge this gap by promoting trade and infrastructure linkages among cities and regions that have been left behind by Western-led Globalization in recent decades (for detailed information, refer to Chapter 3.2.2; 3.2.3; 3.3).

Transitioning from its impact on Globalization, the framework then focuses on the BRI's parallel influence on global urbanization. The BRI can contribute to addressing the pressing need for transportation, industrial, and municipal infrastructure financed and delivered along the corridors, which can significantly benefit global urbanization. Given that urban infrastructure development lags behind the rapid pace of global urbanization, the BRI has the potential to speed up and rebalance urbanization processes by introducing new infrastructure in less-developed regions. This causal connection logically leads to the third dimension of the framework, highlighting the BRI's role in facilitating economic development through accelerated industrialization resulting from infrastructure-driven urbanization

(Xiangming Chen, Julie Tian Miao, Xue Li, 2020).

The interconnection between urbanization and development prompts a deeper analysis of how sustainable development can be achieved when stimulated by Chinese-backed infrastructure projects, such as industrial zones and transportation initiatives under the BRI. Economic development, facilitated by the BRI, can, in turn, foster increased cross-border trade and enhance a favorable position in Global Value Chains (refer to Figure 3.8), ultimately contributing to greater sustainability.

In summary, this section presents a recontextualization of the BRI, emphasizing the intrinsic regional nature of its economic corridors. These extensive corridors serve as conduits for the BRI's influence on Globalization, urbanization, and development, spanning considerable distances and encompassing a wide range of urban and rural areas in less developed and underdeveloped countries. Along these corridors, the BRI's impacts are channeled through the mechanisms of connectivity, infrastructure, and sustainability. The BRI is reconceptualized here as a new framework of corridor-centric Regionalization that exerts its influence on Globalization, urbanization, and development from different levels. Indeed, this process of corridor Regionalization creates a multi-layered network of interactions between global, national, and local scales and actors within the BRI (*Ibidem*).

3.2. Innovation along the BRI

High Speed Trains - HST and the Digital Silk Road are two side projects of BRI. The HSTs effectively connect the Free Trade Zones, the new urban areas foreseen in the National New-Type Urbanization Plan, and then connect to BRI's main railway hubs and industrial centers from where the foreign-bound convoys depart. The Digital Silk Road includes digital infrastructure projects, the use of online platforms to expand foreign trade and internationalize the Renminbi (Bosetti R., 2020; Su, C., & Flew, T., 2021; Fariselli, 2020, pp. 393-426; Bora LY, 2020; Seoane MFV, 2020; Wang and Miao, 2022; Johnston, L. A., 2021; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Schneider, 2021; Fortune; Brookings).

3.2.1. The Iron Silk Road

High-speed trains - HST

A key step towards innovation and development was for China the Medium- and Long-Term Railway Plan - MLTRP in 2004, which concerned the development of a high-speed railway network for freight and passenger transport. At that time, the volume of freight transport was growing at 7.5% per year and was exceeding the capacity of the existing rail network. The objective of the original project was to build 100.000 rail kilometers by 2020, of which 12.000 would be High Speed. The original project has been updated twice and extended until 2030 with a series of Five- years Railways Development Plans (Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Lawrence et al., 2019).

In addition to the High-Speed corridors, the MLTRP also includes regional intercity links (known as rapid rail), with very frequent medium-short passenger services: (i) Bohai Sea Ring (Tianjin, Beijing, Hebei provinces); (ii) Yangtze River Delta (Shanghai, 16 cities in Central and Eastern Jiangsu and Zhejiang provinces); and (iii) Pearl River Delta (Central and Southern Guangdong provinces). In 2008, the first operational High Speed Railway Line was the Beijing-Tianjin line, with a maximum speed of 350km/h and an average speed between stations of 250km/h. It transported 16 million passengers in its first year of operation. In 2009, the first long- distance route was opened between Guangzhou and Wuhan via Changsha. By December 2012, the Beijing-Shanghai and Beijing-Guangzhou lines were completed, connecting the three major economic hubs in China.

In 2016, the MLTRP plan was changed from “four verticals and four horizontals” to “eight verticals and eight horizontals”. Following this update, the target set for 2020 was to reach 150.000 km, of which 30.000 high-speed, reaching more than 80% of small and medium-sized cities. By 2025, the network should reach 175.000 km of extension, of which 38.000 High Speed, with travel times of 1-4 h between medium and large cities, and 0.5-0.2 h for small cities small cities (*Ibidem*).

While initially the main objective was to add more capacity to existing railway lines, providing passengers with higher speed and quality services over medium distances, the focus has now shifted to regional and provincial connectivity in order to support the economic development and urbanization of these regions. For the 2030 targets, the modalities and technologies used remain the same (continuity and consistency), but the aim is a broader geographical development process. The impact of HST goes beyond the railway sector.

Indeed, HST has brought about numerous changes in urban development fostering the tourism increase in many cities. Lastly, it has laid the foundations for the decrease in greenhouse gas emissions and road accidents. Regional and provincial governments aim to attract HS Railway installations in less developed areas, or at least establish more connections with the most important economic hubs, in order to accelerate economic and industrial growth, since “transport improvements can stimulate economic activity if they can improve accessibility” (Lawrence et al., 2019 p.73). The result is the emergence of new business hubs, a greater supply of workers, exchange of ideas and increased production, according to a process of clustering of economic activities.

Although not explicitly included in the investments allocated to BRI, HST trains participate in achieving the same objectives:

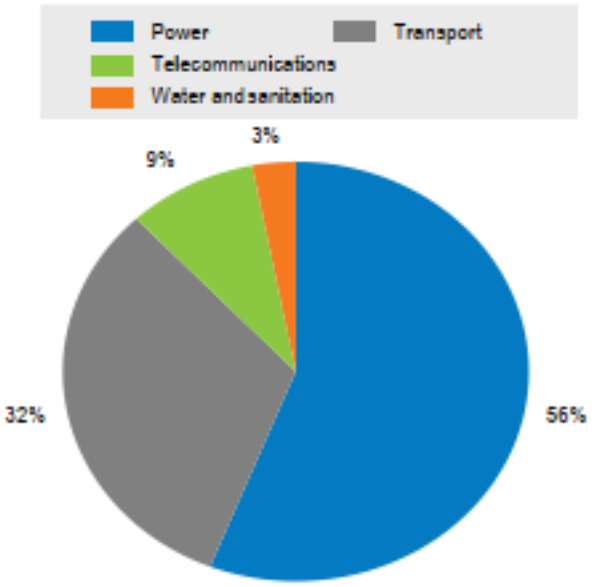
- connect economically more advanced coastal areas to inland regions, facilitating the mobility of more passengers and the transport of goods. This boosts the industrial development of Central and Western regions and reduces the economic and production gap between coastal and inland areas;
- run along the main routes of the new urbanization plan (National New-Type Urbanization Plan 2014-2020) and connect the new urban settlements to the nearby FTZs. From there, they provide the intercity connection to other cities;
- participate in the new standards for the sustainable development of the country. They provide a transport and connectivity service through the use of digital systems to regulate the passage of convoys. In doing so, they maximize the efficiency of transport and substitute rail services for road transport, reducing the emission of Co2 into the atmosphere;
- are an all-Chinese innovation participating in the Made in China 2025 plan. Indeed, the Chinese railway industry is not only one of the world leaders in the field, but agreements and cooperation have already been developed to export HST standards to neighboring countries such as Laos, Thailand, Indonesia, Vietnam and Myanmar.

According to Fig.3.9, the need for infrastructure investments in Asia in 2017 was primarily in electricity, transport, telecommunications and water and sanitation. BRI-associated investments make the most significant and effective contribution to Asia's infrastructure need in the above sectors.

In the BRI's programmatic intentions, targeted investments in sustainable

infrastructure and high-tech would allow the Asian continent its growth momentum, responding to the threat of climate change and reducing the level of poverty. However, the need for infrastructure investments exceeds the BRI projects. Specifically, regions not affected by the BRI corridors would need just as much investment in order to boost their economy and avoid widening the development gap with the regions along the BRI corridors (Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Lawrence et al., 2019).

Figure 3.9 Distribution of infrastructure investments in Asia by sector



Source: Fariselli, 2020, p.415

The China–Europe Freight Train (CEFT)

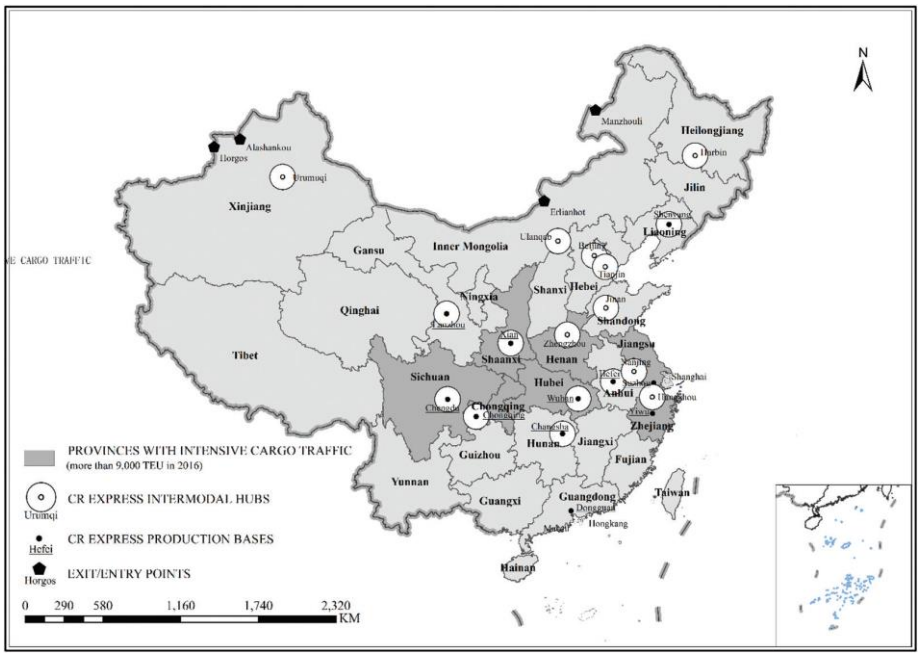
By broadening the connectivity perspective beyond a simplistic regional corridors' connection, it is possible to affirm that the BRI has facilitated robust and durable logistical linkages between China and a wide-ranging and heterogeneous array of regions and cities located outside China's Western land border. The CEFT's Western route is one of these long-range logistics connections that it is worth mentioning in order to clarify BRI's global impact through the connectivity lens (Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020).

Figure 3.10 The China–Europe freight train's trunk routes

Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.37

Since the launch of the first Chongqing-Duisburg CEFT line in 2011, the number of CEFT routes has achieved approximately the number of 60 Chinese cities to over 50 international cities, including 44 cities in 15 European countries and other cities in 14 mostly Central Asian countries. The Western route, which mainly follows the new Eurasian Land Bridge and extends it to the heart of Europe, constitutes about 80% of all CEFT trains. Additionally, it gives rise to alternative routes that extend Southward to intersect with the BRI's China-Central Asia-West Asia Corridor and connect with less developed countries. The Western route of the CEFT encompasses the world's longest cargo train, spanning 13.000 kilometers and crossing eight countries, connecting the Chinese city of Yiwu, located near the coast, to Madrid. Additionally, another route directly links Yiwu to London. Serving as a new global connector, the CEFT establishes strong ties with numerous major Chinese cities, primarily situated in Central and Western regions of the country, serving as pivotal points of departure and return for the network. Among the 16 major CEFT cities in China, nine are intermodal hubs and seven have added production bases (Fig. 3.11). This spatial configuration of the CEFT aligns with the goals of China's second turn (see Chapter 3.1.2), which seeks to promote the development of major interior cities and to bolster their roles in stimulating the less developed inland regions. Many important cities in Central China, such as Changsha, Wuhan, and Zhengzhou, and Western China, such as Chengdu, Urumqi, and Xi'an, are heavily involved in the CEFT. The participation of other coastal cities, including Hangzhou, Suzhou, and Yiwu, as well as the coastal metropolis of Shanghai, points to a broader network of connections between land-based logistics in the interior and export-oriented industrial centers located near major seaports (*Ibidem*).

Figure 3.11 The China–Europe freight train and China's regional realignment



Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.38

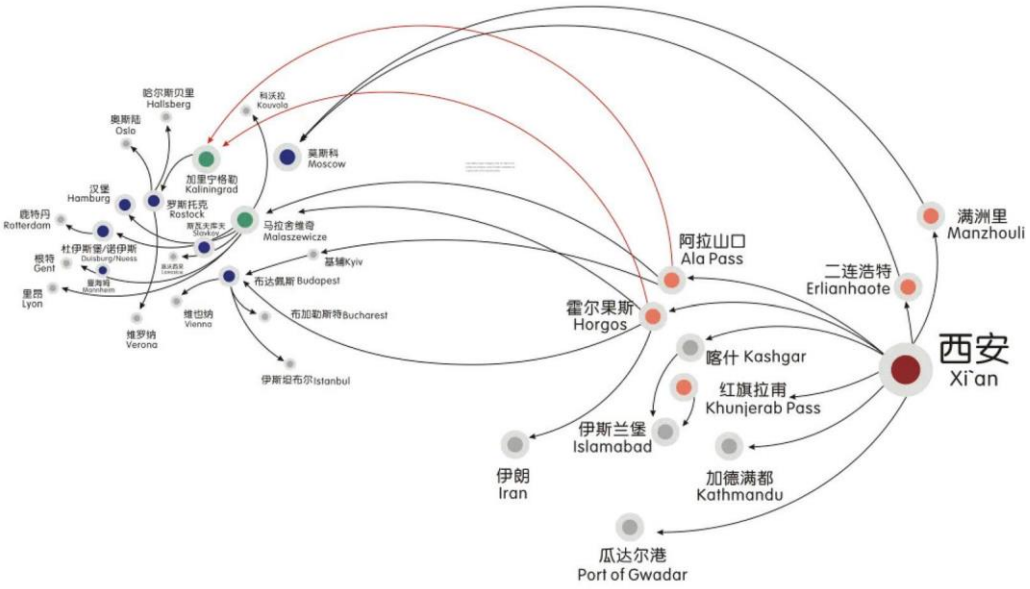
Before 2014, the travel direction along the CEFT primarily involved journeys from China to Europe. Nevertheless, a notable shift occurred in 2016 when return trips began to increase, constituting approximately one-third of the overall trips. Specifically, out of the total of 3.673 trips in 2017, 1.225 trains (33.4%) traveled from Europe to China. The following year, in 2018, the proportion of Europe-to-China trains further rose to 42.0% of the total trips. These findings signify a departure from the previous pattern of unidirectional travel, marking the end of the initial decade of the CEFT being predominantly characterized by trains traveling solely from China to Europe (*Ibidem*).

Xi'an as a pivotal hub

The CEFT's "glocal" network of train routes between China and Europe owes much of its success to the strategic location of China's inland cities, which have emerged as powerful logistics hubs. The city of Xi'an serves as a particularly noteworthy example of this trend. Indeed, in order to put the CEFT at the center of its development, Xi'an municipal government has provided both direct financial support and indirect operational support to the International Trade and Logistics Park (ITLP), becoming the de facto main operator of this infrastructure, which serves as a key hub for sending and receiving China-Europe Freight Trains (CEFTs). This strategy of building Xi'an as a logistics hub has attracted worldwide partnerships. Nippon Express, a prominent international logistics company, transported its

first freight train from the ITLP in Xi'an to Duisburg, Germany. The train was loaded with 41 containers containing high-value goods such as high-resolution liquid-crystal display panels, high-end printers and cameras, air compressors, and other items, valued at US$17 million. This set a new record in 2018 for the highest freight value on a single train. In November 2019, DHL Global Forwarding and Xi'an International Inland Port Investment & Development Group Co. Ltd launched the fastest rail service from Xi'an to Hamburg and Neuss, an important logistics hub on the Rhine River, which reduced the transit time from 17 to 10–12 days. In order to promote global production and trade links with Europe, Xi'an has also attracted manufacturing companies to relocate there for faster shipments (of finished products and components to European markets) than via ocean shipping and at a lower cost than air transport. For instance, Volvo has reaped significant benefits from operating a new regular train between Xi'an and Ghent, Belgium (Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020).

Figure 3.12 Xi'an's growing freight routes to Europe and South and West Asia



Source: Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.41

Furthermore, the CEFT has facilitated the establishment of new trade and production links between China and Western - Eastern countries and cities in Europe, through key hubs such as London in the United Kingdom, Kaliningrad in Russia, Duisburg in Germany, and Małaszewicze in Poland (Figure 3.12). In 2020, Xi'an also expanded its freight services to include destinations like Istanbul in Turkey, Islamabad in Pakistan, and Kathmandu in Nepal, benefiting from the China, Central Asia, West Asia Economic Corridor and the China, Pakistan Economic Corridor (*Ibidem*).

3.2.2. The Digital Silk Road

The Belt and Road Initiative (BRI) is being implemented through a dual-layered approach. The first encompasses the construction of government-level infrastructure that forms the physical Silk Road. This includes cross-regional initiatives focused on enhancing transportation and information technology, i.e., tangible land and sea routes. The second involves the establishment of corporate-level digital infrastructure that forms the Digital Silk Road (DSR), i.e., the development of a virtual and intangible line along the tangible ancient route (Bosetti R., 2020; Su, C., & Flew, T., 2021; Fortune; Brookings; Fariselli, 2020, pp. 393-426; Bora LY, 2020; Seoane MFV, 2020; Wang and Miao, 2022; Johnston, L. A., 2021; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Schneider, 2021).

BAT and BRI - DSR

The BAT (Baidu, Alibaba, Tencent), as a high-tech enterprise in the internet industry, plays a significant role as key contributor to the BRI - DSR (Belt and Road Initiative - Digital Silk Road) by providing essential services in translation, cloud computing, and payment systems. Through its involvement, the BAT has played a pivotal role in accelerating China's rejuvenation plans. From an economic perspective, e-commerce and mobile payment services are fundamental technologies within the BRI, contributing substantially to the regional economic growth. In terms of culture, Baidu and Tencent, as frontrunners in the digitalization of traditional culture, actively contribute to the BRI's cultural sector by implementing cultural heritage preservation programs, aligning with the national objective of revitalizing Chinese culture (Fariselli, 2020, pp. 393-426; Su, C., & Flew, T., 2021; Bosetti R., 2020).

The indispensable contribution of the BAT (Baidu, Alibaba, Tencent) to the Belt and Road Initiative (BRI) can be attributed to their advanced technological capabilities and the influence of platform capitalism. However, their decision to engage in the BRI - DSR should be understood as primarily strategic, driven by considerations such as public relations, brand building, and the expansion of domestic and international business opportunities. Simultaneously, the government acknowledges the significant influence these tech giants have, particularly in shaping the digital economy within China. This recognition aligns with the ongoing global discourse surrounding the power dynamics of large digital platforms, their data control, and their dominant position within advertising markets, evident in debates in the US, Europe, Australia, and other regions (*Ibidem*).

However, the interdependency between the BAT and the BRI - DSR can be understood in terms of their relationship to capital and state power. The state relies on the BAT to develop the digital infrastructure necessary for the BRI, while the BAT benefits from operating as lightly regulated national oligopoly under the state's approval. In this context, the BRI - DSR presents an opportunity for the BAT to expand its influence abroad in alignment with state policies. This initiative enables government-corporate collaboration, but also raises concerns about potential evasion of government oversight. While the BAT will continue their close association with the government as they engage in the BRI - DSR, the future regulatory landscape and the extent of government control over the BAT growing power in the digital economy remain uncertain and needs further analysis that goes beyond the scope of this dissertation (*Ibidem*).

DSR from China's regional perspective – Objectives

As previously mentioned, along with the infrastructure project of trucking, shipping routes, industrial hubs, and Free Trade Zones that constitute BRI, there is the Digital Silk Road (DSR) project. DSR aims at combining Chinese technological innovation with BRI infrastructure, exploiting the benefits that the Internet, 5G, smart cities, AI, cloud-based and industrial platforms, data centers, big data, submarine, terrestrial and satellite links, e-commerce and Fintech bring to trade, some of which will be discussed in this section. At the same time, DSR aims at taking advantage of the new BRI networks to spread Chinese technological standards and consolidate China's high-tech leadership among BRI member countries. Recent literature concerning the Digital Silk Road highlights 6 main objectives: "(a) addressing industrial overcapacity, (b) facilitating global expansion for Chinese corporations, (c) supporting the internationalization of the Chinese renminbi (RMB), (d) constructing China-centered transnational networks, (e) promoting inclusive Globalization, and (f) promoting Internet sovereignty" (Hernandez, 2019, p.11).

(a) Industrial overcapacity

The Chinese ICT electronics manufacturing industry is overproducing due to insufficient domestic demand. This is true particularly for the Chinese market for fiber optic cables, which already exceeded national capacity by 50% in 2015. The Chinese government expects the Digital Silk Road to expand the market by providing China's industrial

overproduction with new business opportunities. Indeed, as banks and the Chinese government provide ample financing for BRI infrastructure, many Chinese companies take advantage of these opportunities to export their digital and high-tech technologies to foreign infrastructure projects, obtaining fundings and expanding their market. For instance, in 2015, the China Development Bank and the Industrial and Commercial Bank of China provided a USD 2.5 billion loan to Bharti Airtel, India's largest telecommunications operator, for domestic infrastructure. Bharti Airtel later commissioned Huawei and ZTE to implement part of the project, expanding the two Chinese companies' overseas market. In general, BRI - DSR represents an important opportunity for ICT companies also because many non-digital infrastructure projects, such as railways, airports, oil and gas pipelines need to be integrated and supported by ICT systems (Fariselli, 2020, pp. 393-426; Bosetti R., 2020).

On the other hand, new communication channels help to expand and reorganize the network for foreign trade, facilitating the export of surplus goods and production means. For instance, thanks to e-commerce, some sectors (e.g., steel) will enjoy new market opportunities abroad. Indeed, between 2013 and 2016, more than 200 online steel trading platforms were created allowing companies in the sector to trade with foreign countries. In particular, a steel-centered e-commerce company, Zhaogang.com, has established a number of branches along the BRI to facilitate the export of products (Hernandez, 2019).

(b) Global expansion of Chinese companies

BRI is seen as one step in China's strategy of opening up to foreign markets, expanding markets, infrastructure and cooperation. The Digital Silk Road coincides with step 3.0 of the opening-up strategy, i.e., increasing the endowment of domestic industries with digital technologies. Indeed, the digital infrastructure and services provided by Chinese companies along the BRI are considered important keys to foreign market access. To this end, the Digital Transformation Partnership Action Plan 2020 “implies a digital upgrade of China’s industrial internet to the innovative 5G networks, cloud-based systems, the enhancement of AI as well as enhancement of smart cities programs”. This plan aims at “progressively pushing domestic digitization through supporting the digital transition of small and medium-sized enterprises” (Bosetti R., 2020, p.7-8). In addition, the Internet+ policy encourages Chinese online enterprises to create innovative and competitive big data analytics, cloud computing applications and platforms that complement traditional Chinese enterprises involved in international ventures with digital systems. Alibaba, for instance, expanded its

data centers in Dubai, Frankfurt and Sydney in 2009, allowing domestic enterprises to access and exchange software and digital resources online; Alibaba Cloud helps other Chinese enterprises to enter into foreign operations, allowing them to save significantly on operating costs. In 2017, Alibaba announced plans to open three new data centers in India, Indonesia, and Malaysia in 2018, which are among the BRI countries (Fariselli, 2020, pp. 393-426; Bosetti R., 2020; Hernandez, 2019 p. 12).

(c) Internationalization of Renminbi

The Chinese currency is used as a driver for the BRI initiative in general, and for the creation and maintenance of the Asian Infrastructure Investment Bank, The Silk Road Fund, and the New Development Bank. Until now, exchange in the global financial system has been dollar-driven or controlled by American institutions. The Digital Silk Road can help establish a transnational financial data network that will give China greater autonomy, improve the international circulation of the RMB, and help the country avoid foreign surveillance and control. “In 2015, the Cross- border Interbank Payment System went live which supports clearing and settlements service for international RMB payments and trade. It is seen as both an alternative and parallel to the US-centered SWIFT system. One Chinese company, IZP Technologies, created "Globebill" a BRI-specific cross-border payment and settlement digital solution which aims to help carry out direct liquidation between the Renminbi and other currencies, bypassing the U.S. Dollar as the intermediary in up to 30 BRI countries and offers dual-currency credit cards in many countries (Hernandez, p.12).

(d) Digital infrastructures

Transnational Internet infrastructures are also of strategic importance for states to expand their geopolitical influence. Despite the perception of cyberspace as virtual space, submarine cables transmit most of the international data traffic, along with land- based cables and satellite links. Today, submarine links are mainly owned and controlled by the US and Europe. The BRICS countries (Brazil, Russia, India, China, and South Africa) had proposed their own fiber-optic cable system to subtract part of their communications from American and European control; however, the project was never realized due to mutual conflicts between the countries and domestic economic inefficiencies.

Therefore, China, by implementing the Digital Silk Road project, intends to create its

own transnational infrastructure network by means of submarine, land, and satellite links along the BRI and in the BRI countries involved. For example, three major SOEs operating in the sector - China Telecom, China Mobile and China Unicom - participated in the construction of the new SeaMeWe -5, the submarine cable connecting Southeast Asia, the Middle East and Western Europe (Fariselli, 2020, pp. 393-426; Bosetti R., 2020).

Overland fiber-optic cables are also a central tool for the China-led global network system. One of the projects under construction is the fiber-optic cable system running between China and Pakistan, which complements the larger project that will cross Eurasia on the whole. A USD 44 million loan from China's Exim Bank and telecommunications equipment from Huawei have been granted for the realization of this project. Lastly, China intends to expand its BeiDou satellite navigation system, an alternative to the American GPS - Global Positioning System. The government aimed to provide each of the major BRI countries with BeiDou navigation services by 2018, and then expand the initiative on a global scale by 2020 (*Ibidem*). "One of the main goals of the BeiDou system is to end military reliance on the US-centered GPS system in China in fear that the US could cut off China or its military from GPS during a dispute. China has already secured agreements with several BRI country governments to use the system in their government and military operations" (Hernandez, 2019, pp. 12-13).

(e) Inclusive Globalization

After Trump withdrew from the Trans-Pacific Partnership, focusing on the rhetoric of America first, the BRI project took on even greater strategic importance; it is the means by which China proclaims its intention to continue along the same directive to achieve a global free market, pursuing a rhetoric of regional and cross-border cooperation independent from US support. Internet technologies, as vehicles of communication and connectivity, have certainly supported these BRI goals. In an article published in the Red Flag Manuscript, the influential party newspaper run by the Communist Party Central Committee, Professor Wang Yiwei divides the Chinese Globalization into 3 phases: 1.0 was the ancient Silk Road, 2.0 was based on colonial rule and Western control, 3.0 is BRI, with internet technologies connecting Chinese inland and rural areas and developing countries (such as ASEAN countries) to global markets through inclusive infrastructure and financial systems (Fariselli, 2020, pp. 393-426; Bosetti R., 2020). One example is Alibaba's Electronic World Trade Platform - eWTP, which readily found political support in 2016. As it will be discussed later in the following section,

eWTP platform promotes the interests of small and medium-sized enterprises (SMEs) in developing countries through logistics, payments and financial services that are accessible and regulated by the digital platform itself.

(f) Internet sovereignty and the spread of a "not free" Internet

The concept of Internet sovereignty means that, according to Beijing, the Internet should be controlled directly by the state, and each state should have the right to regulate its own Internet content without foreign interference. By controlling the Internet, China exerts extensive restrictions on connectivity with the rest of the world and aims to help like-minded governments implement similar models. It is therefore not surprising that most of the Digital Silk Road partners selected by China are countries where the Internet is already rather restricted.

In addition, Chinese ICT companies export digital surveillance systems developed and adopted in China. For instance, the Ethiopian government has actively worked to restrict the right to privacy and freedoms of expression, association, and access to information in the country, using digital monitoring tools such as ZSmart, developed by the Chinese company ZTE (Fariselli, 2020, pp. 393-426; Bosetti R., 2020).

The China Development Bank - CDB, the Export-import Bank of China - EXIM, and state-owned commercial banks provided most of the fundings for ICT hardware projects. For instance, Indian telecom operator Bharti Airtel received USD 2.5 billion, and Russian telecom operator Rostelecom USD 600 million, partly to purchase Huawei and ZTE systems. Another low-interest loan was granted to Huawei Marine for the construction of the 6.000 kilometers of fiber optic cables for the South Atlantic Inter Link – SAIL infrastructure, connecting Cameroon to Brazil.

Meanwhile, during the National Information Strategy (2016-2020), the State Council called on the major private high-tech companies - Alibaba, Tencent and Baidu - to support and participate in the Digital Silk Road projects as they are already global leaders in e-commerce and digital payments. Although projects for the development of smart city, cloud computing and big data are financially supported by the Chinese government, this funding is not as massive as the funds allocated for the hardware projects. South-East Asia was first in the sights of the Chinese tech giants: Alibaba invested USD 4 billion in the Lazada marketplace, and Alipay was extended to eight other Asian countries: Cambodia, Myanmar, Laos, Philippines, Singapore, Malaysia, Thailand and Vietnam. On 3rd December 2017,

during the 4th World Internet Conference, China and seven other countries (Egypt, Laos, Saudi Arabia, Serbia, Thailand, Turkey and the United Arab Emirates) launched a Digital Economy Cooperation Initiative with the aim of sharing the benefits of a digital network and supporting digital development through cooperation and partnerships along the BRI. To date, China has 16 cooperation agreements signed (*Ibidem*).

3.2.3. Alibaba's electronic World Trade Platform (eWTP)

eWTP structure and objectives

Established in 2016, Alibaba's eWTP platform is a private-sector-driven initiative that engages multiple stakeholders to facilitate collaboration between the public and private sectors. Its primary objective is to exchange best practices, incubate innovative trade regulations, and foster an integrated and inclusive policy and business environment to facilitate[104] and develop cross-border electronic trade (e-trade). The core concept behind eWTP is based on the establishment of electronic commerce hubs (e-hubs) that leverage digital platforms and governmental support. These e-hubs are designed to enable small and medium-sized enterprises (SMEs) as well as developing nations to engage in global export activities with minimal or no taxes, fast logistics processes, and efficient customs procedures. Therefore, the eWTP aligns with the broader global political-economic drive towards a more inclusive Globalization.

Furthermore, these e-hubs will create an ecosystem that will shape the digital and physical infrastructure for future commerce, encompassing marketplaces, payments, logistics, cloud computing, big data, and other fields. To realize this unified electronic platform, the eWTP initiative relies on the establishment of Digital Free Trade Zones (DFTZs). DFTZs are critical for eWTP success as they facilitate cross-border trade, investments, and provide cost-effective shipment and cargo options for SMEs, particularly those in developing countries which are the primary targets of the initiative. In addition, e-commerce trade requires a range of services to support the prompt delivery of goods to customers, known as e-fulfilment, which defines the entire delivery process from sales to delivery. Along with e-fulfilment services, DFTZs offer efficient e-fulfilment hubs that are equipped with satellite services and

[104] "The trade facilitation service specifically offers existing and potential trade agents access to Alibaba's e-commerce buyers' and sellers' network. This happens within a digital-logistics-enabled and customs facilitating physical trade e-hub, typically proximate to transport links including an airport" (Johnston, L. A., 2021, p.70).

an e-services platform. Once all these services are set, the e-hubs will go global by linking up with other e-hubs and their respective DFTZs worldwide.

From an operational standpoint, Alibaba's online commerce platforms offer a dual-level engagement framework. Firstly, entrepreneurs can utilize the platform's upload function to efficiently present and continuously update information about their products, enabling them to showcase their offerings to customers. On the other hand, customers are not limited to making online purchases; they also have access to a wide range of digital services associated with the eWTP initiative, including: "logistic services, customs declarations, and shipment and FOREX (Foreign Exchange) facilities for receiving payments" (Johnston, L. A., 2021; Seoane MFV, 2020; Bosetti R., 2020, p.15).

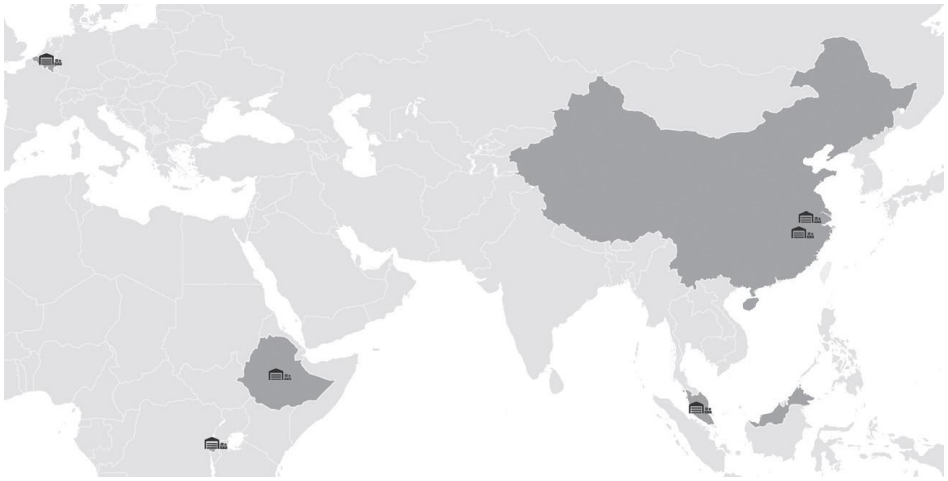
Evolution of the eWTP within and outside China

The first eWTP e-hub was established in Hangzhou on 27 December 2019. This e-hub served as a comprehensive platform offering various services to facilitate cross-border business for SMEs, including online customs clearance, settlement exchange, tax refunds, logistics, and financial services. Its primary goal was to provide a convenient and centralized access point for SMEs to engage with the unified eWTP digital platform. In addition, a second eWTP e-hub was established in Zhejiang province, China, in June 2019. The city of Yiwu not only hosts the second eWTP e-hub in China, but also the world's largest wholesale market for daily commodities (Johnston, L. A., 2021; Seoane MFV, 2020; Bosetti R., 2020).

In line with its objective and organizational structure within China, eWTP has expanded its reach by establishing four e-hubs outside of China. The first e-hub was established in Malaysia[105] in March 2017, followed by e-hubs in Kigali, Rwanda (October 2018), Liege, Belgium (December 2018), and Addis Ababa, Ethiopia (December 2019) (Figure 3.13). These e-hubs have played a crucial role in creating an international distribution network that facilitated the rapid distribution of personal protection equipment manufactured in China during the global outbreak of the Covid-19 pandemic in early 2020 (*Ibidem*).

[105] The Malaysian e-hub, along with is its Digital Free Trade Zone, is by far the most important, advanced and developed e-hub among the others. From a logistical standpoint, it works as follows: "first Malaysian entrepreneur uploads information on their products through Alibaba's cloud to Alibaba's online commerce platforms. Customer can place their order through the Malaysia pavilion, a sub-portal where interested Chinese customers can acquire Malaysian products, or they can directly engage with a Malaysia-based vendor on Ali Express. Once the transaction has been fulfilled, the Malaysian seller begins the export process through varied digital facilities provided by DFTZ's one-stop e-service. In order to run smoothly, this frictionless trade hinges on Alibaba's data technology provided by the Alibaba Cloud, connecting Malaysian SMEs and consumers with their Chinese counterparts" (Bosetti R., 2020, pp.15-16-17).

Figure 3.13: Map of eWTP e-hubs



Source: Johnston, L. A., 2021, p.73

These eWTP e-hubs are designed to offer several key functions in facilitating digital trade. Firstly, they provide a strategically located logistics center that acts as a centralized customs clearance, warehousing, and fulfillment facility. This facilitates faster clearance for imports and exports in the host country and region. Secondly, these e-hubs function as an e-service platform, which connects to Alibaba's OneTouch platform and links the host country directly to the e-commerce pilot area in Hangzhou, thus providing SMEs and businesses with a convenient and efficient means for trading with China. Thirdly, these e-hubs offer digital payment and financing support services, with a particular focus on facilitating business-to-business (B2B) trade for host country SMEs. Lastly, these e-hubs provide digital skills development opportunities for individuals and start-ups through training programs led by the Alibaba Business School, which is headquartered in Hangzhou. These programs are designed to support the development of the digital economy in the host countries (*Ibidem*).

eWTP's issues: from digital colonialism to economic disruption

The eWTP represents more than just a means for least developed countries to digitize their economies; it is a new form of public-private and transnational partnership for digital trade. Indeed, the eWTP can be seen as a component of the broader Belt and Road Initiative - Digital Silk Road (BRI-DSR), as they share a common objective of enhancing the development strategies of participating countries by leveraging their respective comparative advantages. In this context, the eWTP and the BRI embody an inclusive form of Globalization which offers an alternative pathway to development for developing countries, extending its opportunities to actors (particularly SMEs) that were left behind in the previous waves of

Globalization.

Indeed, this work “argues that the Alibaba’s eWTP digital platform is a counter-hegemonic discourse that - based on the economic and technological power of Alibaba and its support of the BRI” and Chinese government – “attempts to globalize” a China-led “global digital trade order to challenge the previous wave of” West-led Globalization and “the existing global trade regime” (Johnston, L. A., 2021; Bosetti R., 2020; Seoane MFV, 2020, p.68, 79).

However, many issues arise and require a deep analysis. The win-win narrative surrounding the eWTP project has been subject to skepticism by scholars and observers (*Ibidem*). They contend that it is hard to view the eWTP as a mere manifestation of equal cooperation between countries. In addition, many argue that the close relationship between eWTP, the Belt and Road Initiative (BRI), and the Chinese government suggests that Alibaba's initiative is not solely driven by economic interests. Rather, it is believed to pursue a broader political vision, specifically a Chinese government’s vision, where China emerges as a cyber superpower that promotes indigenous innovation and its Internet sovereignty abroad, aiming to challenge Western cyber-hegemony while establishing a form of Chinese digital colonialism.

These critics are supported by the fact that Alibaba exercises strategic control over the eWTP platform and the data within its ecosystem. Consequently, participating countries in the eWTP run the risk of becoming heavily reliant on Chinese regional infrastructure, platform access, and data sharing. This potential scenario could result in China assuming a dominant role as the primary gatekeeper for developing countries seeking to leverage new technologies and value chains for their economic advancement. These concerns are part of a broader discourse on whether Alibaba's initiative genuinely promotes a mutually beneficial situation, creating more economic opportunities for local small and medium-sized enterprises (SMEs), or it serves primarily as a mechanism to exploit local resources, gain market control, and win the competition.

In this sense, another issue arises. As previously outlined, data is a fundamental resource in this modern digital economy, and its control and management lie at the center of China's strategic plans for its future economic dominance, from Made in China 2025 to the Internet+ Strategy. Thus, leaving out the definition of the eWTP and BRI – DSR as a hegemonic means for China’s rise in this new wave of Globalization, several scholars and observers (Bosetti R., 2020) propose that Alibaba's effort to construct a global digital infrastructure for e-commerce as part of the Digital Silk Road is not driven by altruistic

motives. Rather, it is argued that Alibaba's primary strategic objective is to secure its forthcoming commercial success through the extraction and acquisition of data facilitated by the eWTP platform.

In addition to the abovementioned data-related concerns, critics of the eWTP (and the DSR) warn that this initiative could not only lead to an increased dependence of other countries on the emerging transnational digital infrastructure centered around China but could also give rise to disruptive dynamics within those economies. For instance, according to many scholars (Bosetti R., 2020), the eWTP initiative could establish a monopolistic position for Alibaba in all the markets hosting its e-hubs, since - for now – these markets allow only Alibaba's services to be utilized locally, while other competitors (e.g., Amazon) remain excluded.

Another concern relates to the potential impact on third countries hosting an e-hub, particularly in terms of their heavy reliance on foreign infrastructure without sufficient development of their own digital capabilities. This situation could potentially impede the growth of domestic digital firms and limit the spillover effects in terms of knowledge transfer for transitioning to a digital economy, as well as the growth of local employment opportunities. Given the limited technological and industrial development in these countries, local businesses would face considerable challenges in competing with Chinese companies, many of which receive support from the central government. These Chinese companies possess significant advantages in terms of scale, highly skilled labor, and innovative practices, placing them well ahead of most other developing countries. Consequently, in countries like Malaysia, only few firms would effectively utilize the eWTP and even then, bridging the technological gap with Beijing would require substantial investments in terms of finances, human resources, business strategies, and time. As a result, only a small group of resourceful local SMEs would be able to successfully undergo this transition to a digital economy and leverage e-hub services to expand their global reach (Johnston, L. A., 2021; Bosetti R., 2020; Seoane MFV, 2020).

eWTP a challenge for the West: from digital standards to a new business model

Alibaba's eWTP platform has profound implications for Western countries and companies that go beyond mere economic competition. The eWTP has the potential to significantly impact the long-term ideological and political race for technology primacy between China and the West. Two key factors shape this competition: the regulatory factor,

involving the establishment of international standards for high-tech sectors like e-commerce, and the business model factor, which will be analyzed below (Johnston, L. A., 2021; Bosetti R., 2020; Seoane MFV, 2020).

In contemporary trade, governments, particularly their companies and businesses, can gain a significant comparative and competitive advantage by taking the lead in establishing standards and regulations within a specific sector. China, with its close collaboration between company executives and the central government, has adopted a proactive and multifaceted strategy to promote its norms on a global scale. This strategy combines market dominance and bureaucratic initiatives, allowing China to exert influence and push its standards globally.

As for market dominance, China has strategically established a dominant position in various domestic markets, including autonomous vehicles, e-commerce services, bike-sharing, payment systems, and facial recognition. This has enabled China to emerge as a major producer and exporter in these sectors, leading to the gradual dissemination of its technologies and standards on a global scale. Notably, in the field of 5G technology, companies such as Huawei and ZTE have emerged as frontrunners, accounting for a significant portion (48.7%) of worldwide 5G equipment sales (Bosetti R., 2020). Leveraging their market position, these companies have exerted considerable influence in the approval of the 3rd Generation Partnership Project's (3GPP) 5G technology as the International Mobile Telecommunications-2020 (IMT-2020) 5G standard at the ITU-R Working Party 5D meeting in 2020. A similar scenario could unfold in the e-commerce sector, where Alibaba holds a prominent position globally, second only to Amazon, and could potentially shape the industry's regulatory standards.

As for bureaucratic initiatives, China has implemented a double approach. Firstly, it has been gradually expanding its influence within international bodies and organizations that play a crucial role in setting standards in the electronics and telecommunications field. Examples include the International Telecommunication Union (ITU), an organization based in Geneva that consists of industry and official representatives, as well as industry bodies such as the Institute of Electrical and Electronics Engineers in the United States, which sets specifications for technologies like wireless and integrated voice/data systems. Secondly, China has been updating and aligning its digital regulations and guidelines by incorporating best practices sourced from various international contexts. For instance, the 2020 Guidelines, which replaced the 2017 Cyber Security Law, have drawn inspiration from the European Union's General Data Protection Regulation (GDPR) (*Ibidem*).

A new business model: China-centered and China-dependent

Another significant implication of the eWTP for Western countries is the emergence of a new business model that diverges from the Western paradigm, which is China-centered and China-dependent. To gain a deeper understanding of its distinctive features, it is useful to compare Alibaba's model with that of Amazon, which best represents the Western e-commerce business model (Johnston, L. A., 2021; Bosetti R., 2020; Seoane MFV, 2020).

Firstly, Alibaba and Amazon, although competitors in the market, have divergent origins and business models. Amazon originated and flourished as a business-to-consumer (B2C) platform, expanding its reach globally through Amazon International websites and establishing itself as a leading provider of e-commerce services and digital content on a global scale. In contrast, Alibaba's success has been primarily built on a business-to-business (B2B) approach. It launched Alibaba.com, a global wholesale marketplace that connected Chinese manufacturers with international buyers. Over the past two decades, Alibaba has ventured into the business-to-consumer (B2C) and consumer-to-consumer (C2C) sectors within the Chinese market, becoming the foremost provider of e-commerce services in the country. Presently, Alibaba aims to extend its services and platforms beyond China's borders.

However, these two companies are not simply market competitors; they also embody distinct business models. Although both provide opportunities for brands to generate sales, their approaches differ significantly. Amazon's focus lies in self-enrichment, as it retains and utilizes data for revenue generation, often competing with its partner brands. In contrast, Alibaba operates as a platform that promotes mutual opportunity and success. A first differentiation stems from how the companies collect and utilize data. Amazon refrains from sharing data with third-party sellers or brands, as it perceives them as competitors in the market. Conversely, Alibaba adopts a more open approach, willingly sharing data with brands to empower them and enhance their sales on the Alibaba platform. Essentially, Alibaba empowers its partners by providing them with the necessary resources for achieving success, while Amazon maintains data restrictions due to its competitive stance toward partner brands. This disparity in their e-commerce contrasting models and operational strategies is reflected in their treatment of small and medium-sized enterprises (SMEs) (*Ibidem*).

While Alibaba’s e-commerce model aims to support SMEs by leveraging its web platform to help them fostering their growth, Amazon's policy, on the other hand, stands at the opposite end of the spectrum, posing difficulties for SMEs to compete and maintain their online relevance. Alibaba does not engage in direct product sales, whereas Amazon assumes

the roles of both producer and retailer, marketing its own products alongside those of other sellers, thereby positioning itself as a competitor to other businesses.

This analysis comes to the following conclusion. Alibaba's adoption of a more cost-effective and scalable new business model can be seen as a strategic asset for both the company and for Chinese government's objectives as well. The Digital Silk Road (DSR) and electronic World Trade Platform (eWTP), conceived as mechanisms for exporting this new model of inclusive Globalization, may hold appeal for developing economies dissatisfied with the Western business approach. Within this new global framework, the eWTP can be viewed as the software component that provides the necessary services, while the Belt and Road Initiative (BRI) can be viewed as the hardware infrastructure that enables the availability of these services (*Ibidem*).

3.3. Belt and Road Initiative and Globalization

Historically, Globalization has been predominantly driven by advanced Western nations, particularly the United States, along with their large multinational corporations and financial institutions. This form of Globalization so far has been characterized by interdependent supply chains, highly developed financial services, and the growing dominance of digital technologies, which have primarily benefited few leaders while placing many less developed countries at a disadvantage. This West-led Globalization has resulted in significant disparities between rich and poor economies, and lagged development for the latter group. As the world's second largest economy, while still a developing country, China has started a new phase of Globalization by establishing extensive cross-border connections, primarily through large-scale infrastructure networks, focusing primarily on developing countries (Wang and Miao, 2022; Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Fortune; Brookings; Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Seoane MFV, 2020; Schneider, 2021).

In this sense, the Belt and Road Initiative (BRI) and the Digital Silk Road (DSR) together present a cohesive force that has the potential to reshape the course of Globalization. This China-led era of inclusive Globalization encompasses two interconnected and parallel processes. On one hand, the BRI challenges the prevailing ideology, drivers, and outcomes of Globalization in the contemporary era. On the other hand, it encourages a more targeted economic cooperation in trade and investment, especially between China and countries in the

Global South, giving priority to the cooperation with less developed countries. The BRI's dual engagement with both Western advanced economies and developing economies has arisen from the context of significant transformations in the Globalization dynamics along with China's rise as a global powerhouse and as one of the most important international players (*Ibidem*).

BRI – DSR as new Asian shaped Globalization?

The European Union Chamber of Commerce in China conducted a survey of all large and small member companies[106] in order to understand the prospects and their level of involvement in the BRI project. The report published in early 2020 outlined some critical issues concerning the participation of European companies in the project. Approximately 50% of the companies responding to the questionnaire complained of insufficient information regarding procurement and conditions for participation, and 40% stated that they experienced a lack of transparency in the awarding of contracts, which is also confirmed by the fact that only 10% of companies became aware of BRI opportunities through tenders or publicly available information (Wang and Miao, 2022; Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Fortune; Brookings; Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Seoane MFV, 2020; Schneider, 2021).

The World Bank Group (Fariselli, 2020, pp. 393-426) stipulates that the basic conditions for the award of international public contracts should be incorporated into the procedures adopted by multilateral development banks, the provisions of the WTO (GPA)[107] and the international model laws developed by UNCITRAL[108]. These regulations provide for transparency and the use of competition as necessary tools for the award of contracts, which must be done through open tendering, measures to prevent collusion among bidders to ensure competition, and must provide clarity on the evaluation criteria to determine the winning bid.

Transparency plays an important role in making companies aware of the opportunities on the market, ensuring sufficient time to prepare a bid and clarifying the requirements for participation in the project. In addition, feedback must be provided to unsuccessful bidders, and services must be put in place through which companies can challenge selection mechanisms that do not comply with national legislation and procurement rules. With regard

[106] The number of member companies to date (2020) is 1.700, with 132 responding to the survey.
[107] Government Procurement Agreement.
[108] United Nations Commission on International Trade Law.

to contracts for complex projects that exceed a certain value threshold, it is recommended that such contracts be opened to international competitive bidding (ICB)[109]. As in any field of public regulation, each country adopts different approaches and, although transparency and competition are two primary principles for the participation and award of public contracts according to the WTO, there is no "one-size- fits-all" model (*Ibidem*).

As for the measures China is taking to award BRI projects, on the other hands, tenders for projects in foreign countries often involve a set of Chinese companies selected by the government itself, or directly contacted by the contracting company. Another common practice in the evaluation of tenders for the awarding of contracts is benchmarking, i.e., comparing business processes and performance with the best examples on the market; the parameters measured are generally time, quality, cost. In spite of this, Chinese procurement is still judged to be far from the transparency and competition criteria set by the WTO. Most BRI projects are awarded to Chinese suppliers, as China aims to allocate government- funded projects to domestic companies (*Ibidem*).

According to the survey by the European Union Chamber of Commerce in China, 54%, 62% and 69% respectively of the contract winning companies involved in the survey stated that the factors favorable to winning were: the supply of goods or services that no Chinese company was able to procure; long- term presence in the market; close relationships with a Chinese company already involved in one of the projects. Indeed, the vast majority of the companies stated that they had been contacted or informed of the opportunity by a partner company or directly by the Chinese government (*Ibidem*).

As for financial firms, it was stated that the best business opportunities lie in "soft BRI-related projects", since large BRI projects, such as infrastructure projects, have already been assigned to Chinese SOEs. In addition, European financial players are often assigned the role of filling gaps, due to lack of Chinese alternatives, in the financial system. Again, the involvement of a European financial firm depends on the existence of relationships with Chinese partner firms already embedded in the BRI context. However, European firms have more mature training and experience in some financial services, and even if they do not have strong links with Chinese firms, they are involved in providing services in areas where European banks have an advantage, e.g., in cross-border transactions and foreign exchange. In addition, they are involved to provide their expertise on third-country markets. In cases where

[109] International Competitive Bidding (ICB) is a bidding procedure required in financing agreements involving the World Bank. The World Bank imposes on its borrowers to follow specific procedures for awarding mandates for services purchased to develop World Bank-financed products.

the Chinese side and the recipient country have not developed a sufficient basis for cooperation over time, mistrust issues may arise, which can be alleviated by involving European financial actors with experience in the recipient country, as they can identify reliable local actors and act as financial intermediaries (*Ibidem*).

Lastly, European quality and safety service companies - QSS, testing, inspection, and certification - TIC have been successful in acquiring a small market share in the pool of BRI-related projects due to their reputation and reliability. While in the vast majority of BRI-related projects, QSS/TICS services are carried on by entities related to large Chinese SOEs, several countries participating in BRI have demanded the provision of genuine third-party inspection and certification services. As industry leaders in the provision of these services, European companies often have deep and long-standing relationships with BRI project beneficiary countries, which are willing to entrust them with full participation in the project, from inception to completion (*Ibidem*).

The 2008 crisis has irreparably disrupted the global economic balance and opened up two possible scenarios. The first leads to a widening of the gap between developed and underdeveloped countries. The more developed countries would cling to the old idea of economic order and prosperity, determined not to give it up. In the second scenario, the West-led Globalization is no longer economically and humanly sustainable, but it can remain possible if the US and Europe admit new ways of development, with the inclusion of China, India, Brazil, Egypt, and many other countries (Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Xu, 2019; Fariselli , 2020, pp.393-426; Zhang et al., 2018). In this situation, the extent to which China will be the one to take full control of the world's economic equilibrium, making its way in this direction through BRI remains to be seen.

At the opening of the “Road to Revival” exhibition at the National Museum of China, in Beijing, on 29 November 2012, Xi Jinping expressed the concept of “China's Dream”, i.e., the dream of the country's prosperity in the 21st century and, above all, the concept of the acquisition of sufficient power to avoid economic dependence on other states, after a century of sacrifices. Since the beginning of the new millennium, the Chinese leadership has insisted on the concept of a “period of strategic opportunity” referring to the country’s domestic development occurred during the first two decades of the 21st century. China's entry into the WTO in 2001, the 11 September terrorist attack, and the 2008 financial crisis and the subsequent economic recession, weakened the US economic leadership, triggered a wave of anti-Globalization and presented for China a chance to realize its “strategic opportunity” and demonstrate to other Western powers its intention and ability to occupy a predominant role in

the global economy (*Ibidem*).

By looking at the current scenario of new inclusive Globalization of which he is the main promoter, Xi Jinping spoke the following words at the World Economic Forum in Davos, Switzerland, on 17 January 2017:

"Some blame economic Globalization for the chaos in the world. Economic Globalization was once viewed as the treasure cave found by Ali Baba in The Arabian Nights, but it has now become the Pandora's box in the eyes of Many [...]. The point I want to make is that many of the problems troubling the world are not caused by economic Globalization [...]. It is true that eco nomic Globalization has created new problems, but this is no justification to write economic Globalization off completely. Rather, we should adapt to and guide economic Globalization, cushion its negative impact, and deliver its benefits to all countries and all nations [...]. Whether you like it or not, the global economy is the big ocean that you cannot escape from. Any attempt to cut off the flow of capital, technologies, products, industries and people between economies, and channel the waters in the ocean back into isolated lakes and creeks is simply not possible. Indeed, it runs counter to the historical trend" (Zhang et al., 2018, p.22).

Among the most prominent projects advanced by China for the realization of this new phase of Globalization[110] is the Belt and Road and Digital Silk Road Initiative. From the very beginning of his term, Xi Jinping has leveraged China's commitment to participate in the development of neighboring countries, based on the principles of friendship, transparency, mutual benefit and inclusiveness. Xi's narrative outlines China's plan to promote the modernization and development of its neighboring economies in tandem with the development of the Chinese economy. In this sense, BRI's HST, CEFT and DSR's eWTP projects have emerged as new regional pathways for more global trade, logistical connectivity and modernization. Moreover, although BRI - DSR infrastructures connect Asia to Europe and Africa, the projects will also affect all other continents precisely because of the network that Globalization has built so far. Thus, in an indirect way, BRI - DSR will affect the strategy

[110] Indeed, China's rise to global economic leadership has made it diverging from the West, thus leading a different Globalization through the BRI – DSR initiative. "Leading a different Globalization does not mean that China will lead the only Globalization. It makes more sense to view the BRI as giving China a great opportunity to introduce new elements and practices that may reshape the current Globalization into a more inclusive and equitable one to the greater benefit of poorer countries and peoples. This is likely to instigate a strong scenario for the coexistence and competition between both the West and China-led Globalizations […]. A litmus test on if China can successfully lead a new Globalization concerns its ability to pursue and achieve a more inclusive Globalization through the BRI"- DSR. "It means China needs to do much better with less and least developed countries that have not advanced under West-led Globalization (South – South cooperation) (Xiangming Chen, Julie Tian Miao, Xue Li, 2020, p.35).

of Russia, whose position on BRI is still ambiguous, the United States, the primary competitor of China's economic power, and the countries of the European Union. This is why BRI - DSR is defined as a global strategy (Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Xu, 2019; Fariselli, 2020, pp.393-426; Zhang et al., 2018).

Again, in Xu (2019), BRI - DSR is analyzed to appear as a phenomenon inherent to the Globalization process. At the political level, the coordination of government strategies through dedicated policies is a necessary precondition for the start-up of a project such as BRI; ASEAN is an example. Indeed, coordinating policies means identifying common policy objectives and increasing mutual trust between countries. Political cooperation affects all areas of a country, including trade and finance. At the same time, through the development of more stable diplomatic relations at government level, the Belt and Road promotes exchanges and cooperation between cultural, academic, media, and non-profit institutions.

At the economic level, there are three main objectives: connectivity, free market and financial integration. Connectivity in BRI is brought not only through dialogue and cooperation, but especially at the infrastructural level, with a network of services for energy production, transport and the exchange and sharing of technical standards. Some researchers claim that this is precisely the feature that distinguishes BRI from all other international cooperation mechanisms. The second economic priority is that of a free market. Investment and trade connect businesses and industries between different parts of the world; BRI - DSR facilitates these exchanges by removing trade barriers between the countries involved, by opening up free trade areas such as Free Trade Zones and Digital Free Trade Zones, by strengthening customs cooperation and cross-border surveillance, by accelerating investment processes and by expanding areas of mutual investment in agriculture, forestry, manufacturing and emerging industries. The third economic objective is to promote integration in the financial sphere, which includes improving financial cooperation, the construction of an investment financing system, and a credit information system. The internationalization of the Renminbi and the establishment of the AIIB are part of this (*Ibidem*).

In conclusion, although the BRI - DSR was launched and promoted primarily by China, it must be understood as part of the process of a new Globalization, projected mainly on Asia but also branching out into its peripheral areas on the African and European continents, which nonetheless sees China as its core engine (Wang and Miao, 2022; Bosetti R., 2020; Fariselli, 2020, pp. 393-426; Xiangming Chen, Julie Tian Miao, Xue Li, 2020; Fortune; Brookings; Silin Y., Kapustina L., Trevisan I. & Drevalev A., 2018; Seoane MFV, 2020; Schneider, 2021).

Conclusions

The purpose of this dissertation is to illustrate the current dynamics and future perspectives of China's role as a driver of this new wave of Digital Globalization, within the context of the contemporary geopolitical and market changes. In pursuing this objective, the analysis highlights some fundamental limitations. Since the topic is very complex, articulated, and subject to constant changes, not all the data used and found in the literature were examined, but rather the most significant ones were chosen. Moreover, some of the material used is likely to be updated over time. Future research could develop further studies that complement the literature already available on current issues.

The remarkable increase in cross-border flows of goods, money and ideas that have reconfigured the inter- and intra-national relations and policies during the last thirty years have been crucial within a globalized international market. However, looking at the recent changes that characterize the current global economic and geopolitical scenario, the phenomenon of Globalization is clearly in transition. Indeed, the market tensions, geopolitical rivalries and protectionist measures that have primarily targeted the technology industry (US-China trade war), as well as the severe global economic consequences arising from the Covid-19 pandemic, the global inflation and the Russia-Ukraine military conflict have exacerbated a path that began with the 2007-08 financial crisis, leading to a slowdown of some global integration's indicators (global trade, global trade openness index, export, FDI). This reaction to the previous Hyperglobalization phase is defined by many as Deglobalization (or Slowbalization). Numerous scholars argue that Globalization has ended, and that international trade has peaked. However, this perspective is incomplete. In fact, there is compelling evidence to suggest that a new phase of Digital Globalization has emerged. Over the past few decades, the progression of technology and the explosion of data have led to the emergence of Globalization 3.0. The worldwide exchange of goods has evolved from physical to more intangible goods such as education, healthcare, and culture, to now on data, information, technology, and finance. Therefore, Globalization is changing nature (Chapter 1). Within this shifting global landscape, McKinsey & Company reports (2016, 2019, 2022) identified several changes that have occurred in Global Value Chains in the past decade. Goods-producing value chains have become less trade-intensive. Output and trade both continue to grow in absolute terms, but a smaller share of the goods is now traded across borders. Cross-

border services are growing faster than trade in goods, and they generate far more economic value than traditional trade statistics capture. Global Value Chains (computer and electronics) are becoming more regionally concentrated, especially within Asia and Europe, more knowledge-intensive and more reliant on high-skill labor and less reliant on labor-cost arbitrage. Intangible assets (R&D, design, brand, IPRs, marketing, post-sale services), cross-border data flows and new technologies (digital platforms, the internet of things, and automation, AI, AR and VR) are transforming Global Value Chains. Indeed, many scholars conceptualize an evolution towards a Digital Value Chain. The Smiling Curve shows, with particular reference to the Internet and digital platform industry, how the value created along the chain is not evenly distributed. In particular, the largest share of value created lies in the activities (lead segments) placed at the extremes (upstream and downstream), where a growing concentration of intangible assets resides. In between, the share of added value is lower and refers to manufacturing (and assembly) activities that tend to be offshored and outsourced to developing countries (China, Vietnam, India, etc.) and are prerogative of a large number of suppliers that come to depend on the decisions of a limited number of leading companies in the most advanced economies. Indeed, due to their leadership in technological innovation, product design and marketing, internet companies play a leading role in the industry and control the key segments of GVCs. Their dominant position allows them to control participants' integration to the GVC system; to benefit from their role of natural monopolies (only one firm being able to efficiently provide the service), from the complementarities between the participants to the chain (each component's value is enhanced through its combination with other components), from the collection of data generated by the activities along the chain, and from the uneven distribution of returns to scale between tangible intensive and intangible intensive nodes. Thus, a profound asymmetry of power is generated within an intellectual monopoly scenario. Proper integration and participation within GVCs are therefore crucial. It is closely linked to the ability of companies and countries to generate and exploit innovation, determining the possibility of improving their position within the system itself (industrial upgrading). Conversely, there may be risks of uneven geographical distribution of intangibles and socio-economic development, stagnation dynamics, innovation disinvestment, and inequality issues. In short, the concept of Globalization has not been replaced by Deglobalization or Slowbalization but has instead transitioned into a new phase of profound changes that will have implications on how businesses choose to operate and compete globally. Whereas before, according to McKinsey's 2016 - 2019 reports, the world was connected by trade, people, capital and data, the new 2022

report updates the previous scenario and shows that, digitally speaking, the world has never been more connected and that flows of intangibles (R&D, design, brand, big data, knowledge, know-how etc.), services, intellectual property (IP) and international students are the drivers of this new wave of Digital Globalization. In the new digital economy, digital platforms, Global Value Chains and international trade are intrinsically linked. The parallel development of these factors offers micro, small, and medium-sized enterprises (MSMEs), along with individuals, and developing countries the chance to participate in a more inclusive global economy. E-commerce marketplaces can decrease transaction costs, including finding products or customers, handling payments, and reducing information asymmetries. Nevertheless, since inadequate infrastructure and limited digital capabilities continue to exclude many economical actors from the digital platform economy, it is then crucial to provide access to ICT infrastructure and education to increase participation rates. This digital revolution has led to the emergence of new business models that rely heavily on data. Data plays a critical role in the production processes of goods and services and is increasingly viewed as a valuable asset by businesses, which use it to gain business insights, optimize processes, improve products and services, and conduct research and development. From a business point of view, measuring data in terms of bits and bytes (measuring data volume) could be useful in understanding a company's data value-generating potential. However, measuring data economic value (i.e., a combination of factors, including the data's information content, demand for the data, and its intended use - monetization), while at the same time understanding how companies generate and capture economic value through their adopted business model, could be a key factor in answering essential questions, for instance, about which products or services to offer to which customers, how to deliver economic value, and at what price. The widespread use of digital technologies and the rise of (cross-border) digital flows have led some governments highlight significant issues related to internet governance. China, EU and United States's divergent (and to some extent protectionist) approach reflects their competition for technological dominance and control over the digital economy, which involves the use of regulations, legislation, and data sovereignty. Despite differences in values and geopolitical tensions, there is a growing consensus among scholars, institutions, and the digital industry itself that more harmonized global regulation is necessary. This has led to proposals for the creation of a Digital Stability Board (DSB), a multi-stakeholder forum that would establish global governance for big data, artificial intelligence, and digital platforms through global standards and regulatory measures.

Looking back at the last two decades of economic reform and opening, China's

engagement with the global economy has evolved in response to internal and external factors. In particular, China's relationship with Globalization has always been characterized by a delicate balance between the benefits of participating in global trade and the risks of external shocks (US-China trade war, Covid-19 pandemic, geopolitical tensions and military conflicts). These tensions are reflected in China's current dual circulation strategy. Following its integration within the global economy and the GVCs system (strategic coupling), China has undergone an economic transition (towards attracting FDI, Western transnational corporations, component suppliers, contract manufacturers), becoming at the threshold of the new millennium one of the most integrated and inclusive global manufacturing ecosystems (world's factory). In parallel with a profound reorganization of the GVC system (after 2007-08), the relocation (decoupling and recoupling) of the electronics industry from the coastal regions to the inland provinces of the Chinese state (in parallel with the emergence of Chinese domestic market-oriented production structures) led to a progressive spatial expansion of several Asian ODMs/EMS (Foxconn as the leading Chinese exporter). In short, the remarkable reorganization of the Chinese world factory over the past two decades expresses the coexistence of an export-oriented industry and domestic market-oriented production structures in the different Eastern, Western and Central regions of China (dual circulation strategy). A deep analysis conducted in Chapter 2 shows that China's strong ability in exports (ICT sector) has been crucial in determining its rise as a technological superpower and has led it to develop strong relationships with some of the surrounding South-East Asian countries. A further macroeconomic analysis (spatial distribution of import-export, analysis of backward and forward links and the composition of the share of value added captured by each region operating in the ICT industry in East Asia) shows the deep interconnection and interdependence of the countries of this group (which are the main players within the ICT GVC production system), with China (South-East) playing a crucial role in promoting the industrial upgrading and development of the entire (South-East Asian) region. China has increased its leadership within the South-East Asian RVC and GVC systems through a shift from a status of world's factory to an innovative state one. This shift has taken place by enhancing the quality of its inward FDI (from FDI in textiles to FDI in manufacturing and high-tech – ICT sectors); by exploiting knowledge spillovers and technology transfer; increasing its technological capabilities, thus facilitating the rise of several successful domestic brands (Huawei, Xiaomi, ZTE, OPPO) and digital platforms (Baidu, Tencent, Alibaba), able to compete in the domestic and international markets; projecting itself outwards through ODI (mainly to the South-East Asian region) in software, information

technology, services, chemicals, communications and other high value-added activities. While it was initially focused on manufacturing and assembly (low value-added) activities and dependent on foreign investment, components, and technology (IP), China's economic development model, especially after the 2008 financial crisis, began to shift towards more technological autonomy. In doing so, China started to move away from the export-led and foreign-led GVCs and investment-driven development model transitioning towards a domestic market-driven development model with a rebalancing of expenditure in favor of domestic consumption, and indigenous innovation. These goals are carried out by the 14th Five-Year Plan (2021-2025) and the Made in China 2025 strategy with which China aims to become a global manufacturing powerhouse and by 2049 to achieve global technological leadership. An econometric analysis of China's rise as a leader in several digital technologies (consumer electronics ICT - smartphone, fintech, artificial intelligence and 5G standards) and in e-commerce sector is useful to better understand the integration, the characteristics, and the positioning of China's trade in services in the higher ends of the Digital Global Value Chain along with China's shifting position from digital input to digital output in this system. Indeed, China is now the largest international trader in the production of goods and the second largest trader in the services sector (advanced manufacturing and services hub), it holds the second largest digital economy in the world and its current digital economy development strategy focuses on accelerating the development of digital industrial chain, value chain and data asset ecosystem (at home and abroad through digital services export). However, China maintains significant restrictions on foreign competition in the digital sector, with limitations on imports and a highly regulated internet governance system that mandates data localization and restricts online information access. These restrictions seem to be in contrast with China's efforts to shape the international environment and to promote the development of norms and rules related to data governance that align with its domestic approach. Since the future is unlikely to benefit from protectionism and Internet sovereignty, China has accelerated its domestic personal information protection legislation and has started leveraging international agreements (BRI) to encourage two-way data flows. Indeed, Globalization and digital disruption have reshaped the world trade order and industrial landscape - a process that has put China at the center. China economic system's changes that have occurred since its accession to the World Trade Organization (2000) boost the likelihood that the Chinese state will emerge as the world's largest economy in the coming decade. This led some scholars to suggest that China's economic system is no longer compatible with Western capitalist economies and to predict a potential US-China decoupling in the near future. By looking at

their trade relationship (2018-2022), indeed, recent US-China imports and exports data show that the two economies are becoming less directly interdependent. This scenario could have potential implications for companies operating in China, for South-East Asia regional development and for GVCs. As for the latter, recent trends show a GVC restructuring (especially in the ICT sector) that was visible even before the US-China trade war (2018). Indeed, several lead firms, with particular reference to the electronics industry (Apple), started to consider a shift of part of their supply chains (low value-added, labor-intensive activities) out of China to more cost-effective destinations in South-East Asia (Vietnam) or to India. Nevertheless, although China's centricity as the world's factory has begun to fade, by virtue of a skilled workforce, excellent infrastructure capacity, and an unrivaled speed of hardware innovation, it remains an outstanding manufacturing hub. Therefore, leaving China is not that simple (not coming home). However, in order to prevent that a US-China potential decoupling proceeds uncontrolled, a major recalibration of US-China economic relationship along with future negotiations and a new trade policy approach based on interoperability is required. In any case, China’s high economic growth along with the relevant role it has assumed in recent decades within the GVC system and the global economy (as supplier and exporter of components, services and high-tech products) have led it to play a key role in the international business market. Indeed, China has launched a series of initiatives (BRI - DSR) aimed at reaching global economic and trade development (shaping Globalization) as a stakeholder, donor, and international partner.

The project that currently conveys the largest share of Chinese OFDI is the one that refers to the Silk Road and is identified by the acronym BRI - Belt and Road Initiative (Chapter 3). BRI has a basically Central Asian projection, but also expands itself including European, Middle Eastern and North African countries. It is a complex and articulated initiative promoted by the Chinese government and includes various projects, coordinated by different Ministries, which evolve over time depending on the geopolitical relations and the inter - governmental agreements underlying these projects. BRI uses financial resources that include investments, loans, joint ventures, and various cooperation instruments managed by different Chinese, Asian and international financial institutions. Due to these characteristics of strong planning and flexible implementation, it is difficult to quantify precisely the amount of financial resources that will be mobilized, but investment projects are estimated to be around $1 trillion over a 10-year period starting in 2017. BRI's main purpose is to establish a modern large-scale infrastructure network that, through cross-country connectivity (maritime, terrestrial, digital) of a huge area - currently fragmented and relatively isolated from the major

trades of Globalization -, will stimulate the economic growth and development of the area itself. The Belt and Road Initiative (BRI) is being implemented through a dual-layered approach. The first encompasses the construction of government-level infrastructure that forms the physical Silk Road. This includes cross-regional initiatives focused on enhancing transportation and information technology, i.e., tangible land and sea routes. The second involves the establishment of corporate-level digital infrastructure that forms the Digital Silk Road, i.e., the development of a virtual and intangible line along the tangible ancient route. As the operational arm of the government-party, the SOEs are mainly involved in the implementation of such projects, but private companies also have an interest in considering the establishment of their OFDI strategies from the BRI perspective. The BAT (Baidu, Alibaba, Tencent), as a high-tech enterprise in the internet industry, is one of the main contributors of the BRI - DSR. China aims to be the center of gravity of this operation that, in the current scenario of profound geopolitical uncertainty characterized by increasing Regionalization and disruption generated by this new wave of Digital Globalization, many consider as a new "Asian-shaped" Globalization. In this regard, China crosses its global projection with its domestic market needs. Indeed, BRI - DSR serves the purpose of resolving domestic imbalances such as overcapacity in certain industries (e.g. steel; photovoltaics; fiber optic cables); expanding the market reach of industries with different degrees of technological maturity (e.g. HST ; EV ; 5G and telecommunication infrastructures; smart cities; AI; cloud-based and industrial platforms; data centers; big data; submarine, terrestrial and satellite links; e-commerce; Fintech); leveraging the abundant local resources (e.g. raw materials, labor force) to delocalize low value-added segments of China's GVCs towards the developing countries along the belt; increase the pool of S&T and R&D resources through cooperation agreements with BRI countries as a follow-up of inter-governmental infrastructure financing projects. At the same time, BRI - DSR exerts a strong weight in China's geopolitical positioning, as it networks the government with a very large and heterogeneous group of states (65) on a politically neutral but substantially influential level, and also exerts a strong weight on the country's internal cohesion, as it conveys an idea of leadership based on internal solidarity and international cooperation. In addition, BRI offers China the value framework to which refer to in order to gain power and legitimacy internally and externally, and also to fill the power gaps that the US self-exclusion from regional trade cooperation agreements have left (2018) and that China is ready to fulfill. Indeed, after Trump withdrew from the Trans-Pacific Partnership, focusing on the rhetoric of America first, the BRI - DSR project took on even greater strategic importance; it is the means by which China proclaims its intention to

continue along the directive to achieve a global free market, pursuing a rhetoric of regional and cross-border cooperation independent from US support. Internet technologies, as vehicles of communication and connectivity, have certainly supported these BRI goals in connecting Chinese inland and rural areas and developing countries (such as ASEAN countries) to global markets through inclusive infrastructure and financial systems. One example is Alibaba's Electronic World Trade Platform - eWTP, which promotes the interests of economic actors (especially small and medium-sized enterprises - SMEs) located in developing countries that were left behind in the previous waves of Globalization. In doing so, eWTP aims at providing logistics, payments and financial services that are accessible and regulated by the digital platform itself. This digital ecosystem consists of e-hubs (located in China, Malaysia, Rwanda, Belgium, Ethiopia) and is supported by DFTZs (Digital Free Trade Zones), specific areas which facilitate cross-border trade, investments and offer more affordable shipments' costs for SMEs. The eWTP represents more than just a means for least developed countries to digitize their economies; it is a new form of public-private and transnational partnership for digital trade. However, many issues arise and require a deep analysis. Firstly, the establishment of an e-hub under the control of a sole actor - Alibaba - which operates under exclusive economic conditions (located in a DFTZ) could over time lead to the establishment of an e-commerce monopoly. Being the primary source of e-commerce services could establish a network of countries that would progressively become China-dependent (on infrastructures and services) and China-centered (as a result of their economic and technological dependence). Another concern relates to the potential impact on third countries hosting an e-hub, particularly in terms of their heavy reliance on foreign infrastructure without sufficient development of their own digital capabilities. This situation could potentially impede the growth of domestic digital firms and limit the spillover effects in terms of knowledge transfer for transitioning to a digital economy, as well as the growth of local employment opportunities. Given the limited technological and industrial development in these countries, local businesses would face considerable challenges in competing with Chinese companies, many of which receive support from the central government. These Chinese companies possess significant advantages in terms of scale, highly skilled labor, and innovative practices, placing them well ahead of most other developing countries. Consequently, only few firms would effectively utilize the eWTP and even then, bridging the technological gap with Beijing would require substantial investments in terms of finances, human resources, business strategies, and time. As a result, only a small group of resourceful local SMEs would be able to successfully undergo this transition to a digital economy and

leverage e-hub services to expand their global reach. Despite these issues, this work "argues that the Alibaba's eWTP digital platform is a counter-hegemonic discourse that - based on the economic and technological power of Alibaba and its support of the BRI" and Chinese government – "attempts to globalize" a China-led "global digital trade order to challenge the previous wave of" West-led Globalization and "the existing global trade regime" (Johnston, L. A., 2021; Bosetti R., 2020; Seoane MFV, 2020, p.68, 79). The BRI - DSR and Alibaba's electronic World Trade Platform (eWTP), conceived as mechanisms for exporting this new model of inclusive Globalization, may hold appeal for developing economies dissatisfied with the Western business approach. Within this new global framework, the eWTP can be viewed as the software component that provides the necessary services, while the BRI - DSR can be viewed as the hardware infrastructure that enables the availability of these services.

Historically, Globalization has been predominantly driven by advanced Western nations, particularly the United States, along with their large multinational corporations and financial institutions. This form of Globalization so far has been characterized by interdependent supply chains, highly developed financial services, and the growing dominance of digital technologies, which have primarily benefited few leaders while placing many less developed countries at a disadvantage. This West-led Globalization has resulted in significant disparities between rich and poor economies, and lagged development for the latter group. The 2008 financial crisis has irreparably disrupted the global economic balance and opened up two possible scenarios. The first leads to a widening of the gap between developed and underdeveloped countries. The more developed countries would cling to the old idea of economic order and prosperity, determined not to give it up. In the second scenario, the West-led Globalization is no longer economically and humanly sustainable, but it can remain possible if the US and Europe admit new ways of development, with the inclusion of China, India, Brazil, Egypt, and many other countries. In this situation, the extent to which China will be the one to take full control of the world's new economic equilibrium, making its way in this direction through BRI - DSR projects remains to be seen. In this sense, BRI's HST, CEFT and DSR's eWTP projects have emerged as new regional pathways for more (and more inclusive) global trade, logistical connectivity, and modernization. In addition, although BRI - DSR infrastructures connect Asian countries to European and African ones, the projects will also indirectly affect all other countries in the world because of the network that Globalization has built so far. This is why BRI - DSR is also defined as a new tool for Global Regionalism. In conclusion, although the BRI - DSR was launched and promoted primarily by China, it must be understood as part of the process of a new Globalization, projected mainly on Asia

but also branching out into its peripheral areas (African and European continents), which nonetheless sees China as its core engine.

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